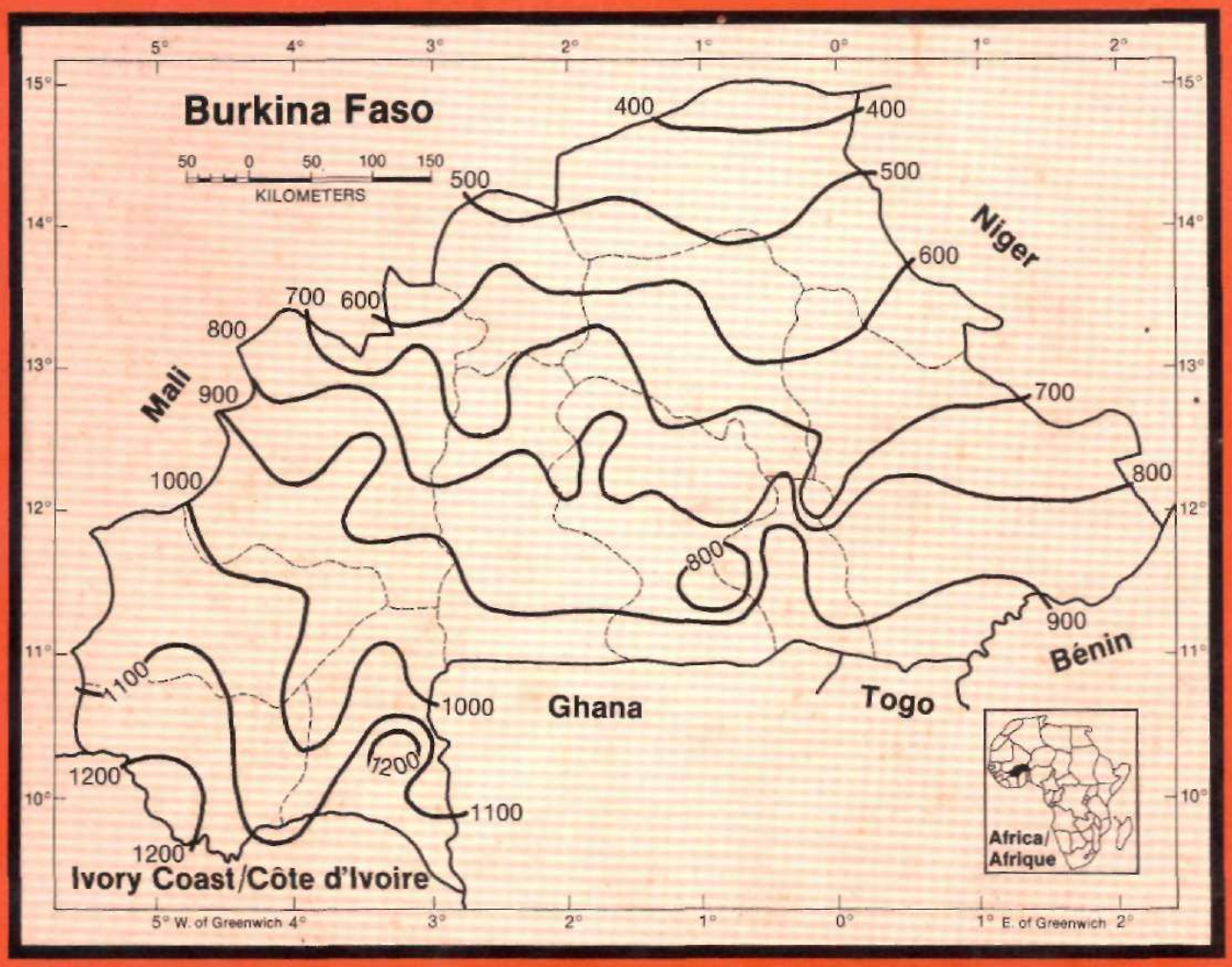
Agroclimatology of West Africa: Burkina Faso



ICRISAT

Information Bulletin no. 23

International Crops Research Institute for the Semi-Arid Tropics

Correct citation: Sivakumar, M.V.K., and Faustin Gnoumou. 1987. Agroclimatology of West Africa: Burkina Faso. Information Bulletin no.23. Patancheru, A.P. 502 324, India: International Crops Research Institute for the Semi-Arid Tropics.

Abstract

M.V.K. Sivakumar and Faustin Gnoumou. 1987. **Agroclimatology of West Africa: Burkina Faso.** Information Bulletin no. 23. Patancheru, A.P. 502324, India: International Crops Research Institute for the Semi-Arid Tropics.

In Burkina Faso, where 90% of the population depends upon subsistence agriculture for its livelihood, both the amount and distribution of rainfall during the growing season markedly determine the agricultural productivity. In this study, the temporal variability in rainfall over Burkina Faso is described at different scales: annual, seasonal, monthly, and decadal. Rainfall dependability is explained using probability analysis of decadal totals. Monthly means of maximum and minimum air temperature are used to compute the probabilities of temperatures exceeding defined threshold levels. Simple water balance models are used to describe the variation in available soil-moisture storage and water-availability periods for different locations. Applications of the analysis of climatic data in crop planning are presented.

Résumé

M.V.K. Sivakumar et Faustin Gnoumou. 1987. **Agroclimatologie de l'Afrique de l'Ouest : le Burkina Faso.** Bulletin d'information n° 23. Patancheru, A.P. 502 324, Inde : International Crops Research Institute for the Semi-Arid Tropics.

Au Burkina Faso, où 90% de la population dépend d'une agriculture de subsistance, la quantité des pluies et leur distribution pendant la saison de culture déterminent d'une façon marquée la productivité agricole. Dans cette étude, la variabilité temporelle dans la pluviométrie du Burkina Faso a été décrite à différents niveaux : annuel, saisonnier, mensuel et décadaire.

La stabilité pluviométrique a été expliquée en utilisant l'analyse de probabilité des totaux décadaires. Les moyennes mensuelles des températures maximum et minimum de l'air ont été utilisées pour calculer les probabilités des températures excédant les seuils définis. Les modèles simples de bilan hydrique ont servi pour décrire la variation dans l'humidité disponible du sol et la disponibilité de l'eau à différentes périodes pour différents sites. Les applications de l'analyse des données climatiques à la planification des cultures ont été également présentées.

A French edition of this Bulletin is also available.

The International Crops Research Institute for the Semi-Arid Tropics is a nonprofit scientific educational institute receiving support from donors through the Consultative Group on International Agricultural Research. Donors to ICRISAT include governments and agencies of Australia, Belgium, Canada, Federal Republic of Germany, Finland, France, India, Italy, Japan, Netherlands, Norway, People's Republic of China, Sweden Switzerland, United Kingdom, United States of America, and the following international and private organizations: Arab Bank for Economic Development in Africa, Asian Development Bank, Deutsche Gesellschaft far Technische Zusammenarbeit (GTZ). Global 2000 Inc., International Development Research Centre, International Fertilizer Development Center, International Fund for Agricultural Development, The European Economic Community. The Ford Foundation, The Leverhulme Trust, The Opec Fund for International Development, The Population Council, The World Bank, United Nations Development Programme, and the University of Hohenheim. Information and conclusions in this publication do not necessarily reflect the position of the aforementioned governments, agencies, and international and private organizations.

Cover: Mean annual rainfall(mm) in Burkina Faso.

Agroclimatology of West Africa: Burkina Faso

M.V.K. Sivakumar and Faustin Gnoumou

ICRISAT

Information Bulletin no. 23

International Crops Research Institute for the Semi-Arid Tropics
Patancheru, Andhra Pradesh 502 324, India

1987

ISBN 92-9066-122-4

Contents

Appendixes

Foreword

This report on the agroclimatology of Burkina Faso is the third in a series planned by ICRISAT. The first report on Niger was published in 1980 and the second on Mali in 1984. We hope this report will prove as useful as the earlier ones to scientists, agencies, and planners working to improve agricultural production in Africa.

ICRISAT's efforts in improving agriculture are focused on the semi-arid tropics (SAT). Low and variable crop production primarily owing to erratic rainfall are characteristic of this region. Most of the rain falls in a relatively short rainy season. The aim of ICRISAT's Resource Management Program includes developing suitable technology for soil and water management for these areas in a three-way approach: (1) assessment of the soil, water, and climatic resources of the various ecological regions of the SAT; (2) identification of the major physical, biological, and socioeconomic processes that make up farming systems of the SAT; (3) investigations of the means by which these processes can be purposefully managed.

The tropics–especially the SAT–owing to the peculiar distribution of the natural resources of soil and climate, call for specific cropping systems and farming systems technology. Assessment and interpretation of the natural resources, particularly those related to water in agronomically relevant terms, therefore, assume a special significance. We believe that such quantification will assist in developing a relevant technology and help in its transfer.

At ICRISAT, in cooperation with the national programs and international agencies, we have created a rainfall data bank for Botswana, Burkina Faso, Chad, Ethiopia, India, Malawi, Mali, Niger, Senegal, Thailand, and the Brazilian northeast. We are enlarging the data bank further with data from areas currently unrepresented. Meteorological data relating to evapotranspiration are also being collected.

This series of reports on agroclimatology reflects our recognition of the continuing need to share the information to help plan the food production in an area of the world where food deficits are a matter of grave concern.

L. D. Swindale
Director General
ICRISAT

Agroclimatology of West Africa: Burkina Faso

M.V.K. Sivakumar and Faustin Gnoumou*

Introduction

Burkina Faso (formerly Upper Volta) is a landlocked country that stretches across 274 000 km^2 in the Sahelo-Sudanian Climatic Zone of West Africa. The country lies between 6°W to 2° 30'E and between 9° to 15°N. It is wedged between six other countries: Mali, Niger, Ivory Coast, Ghana, Togo, and Benin. The high population density (25 inhabitants km^{-2}), lack of natural energy resources, poor industrial development, and low agricultural productivity are responsible for its low per capita productivity. Agriculture accounts for two-fifths of the Gross National Product of Burkina Faso. Subsistence farming is carried out in about 90% of the cultivated area.

The assessment and interpretation of the availability of natural resources in agronomically relevant terms is an important activity that could aid crop planning. For example, the amount and distribution of rainfall, the duration of the rainy period, high potential-evapotranspiration rates, and the variability in the soil and its water-holding capacity are the dominant features that should receive careful consideration.

In the present study, a description of the rainfall variability in Burkina Faso is attempted through the analysis of annual, seasonal, monthly, and decadal (10-day) totals. The seasonality of rainfall and its dependability are described through the probability analysis of rainfall carried out on a decadal basis. Climatic water-balance studies were carried out using decadal rainfall as input to the soil-moisture storage and estimated evapotranspiration as withdrawal. The application of this analysis in crop planning is also described.

Physiography

The relief of Burkina Faso is mainly flat, with an average altitude of about 300 m. The highest point is at Teninkourou (749 m) in the south-west, near the junction of the borders of Mali, Ivory Coast, and Burkina Faso, while the lowest altitudes occur in the south. The

*Principal Agroclimatologist, ICRISAT Sahelian Center, Niamey, Niger; and Chief, Division of Agrometeorology, AGRHYMET Center, B.P. 11011, Niamey, Niger; respectively.

nature of the rocks and the morphological history permit the distinction of two large topographical regions–the large peneplain and the sandstone massif (Editions Jeune Afrique 1975). The peneplain extends over three-fourths of the country with isolated hillocks here and there. The sandstone massif, located in southwest Burkina Faso, is a very elevated and uneven region.

Soils

Generally the soils of Burkina Faso are very poor in nutrient elements. In 55% of the soils studied by UNDP-FAO (1980), the organic matter content was less than 1% while in 29% of the soils, the organic matter content varied from 1% to 2%, and was greater than 2% in only 16% of the cases. In about 71% of the soils of Burkina Faso, the total nitrogen was less than 0.06%. The soils are very poor in phosphorus. In about 93% of the soils studied, the P2O5 was less than 0.06%. The water-soluble phosphorus was less than 30 ppm. The soils are mostly poor in exchangeable potassium.

The nature of soils in Burkina Faso is related to the early origin of the underlying rocks with the surface eroded through a long period of time. In the soils map of Africa published by FAO-UNESCO (1977), the soils of Burkina Faso have been classified into 10 major types (Fig. 1). Luvisols are the most dominant, followed by Regosols. In the western region, Cambisols are more frequent. The other soil types include Acrisols, Fluvisols, Regosols, Lithosols, Arenosols, Vertisols, Planosols, and Nitosols.

Vegetation

In Burkina Faso, the natural vegetation consists mainly of steppes, savannahs, sparse woodlands, or more often, a continuous or discontinuous graminaceous cover. According to Editions Jeune Afrique (1975), certain factors make it hard to exactly delineate the zones of vegetation: a relief that is not well defined, rainfall that varies gradually from one climatic zone to another, predominance of secondary formations arising from the decomposition of the primary vegetation.

In the Sahelian Zone, which covers the region north of 14°N, several species of Acacia, Ziziphus mauritiana, Adansonia digitata, and several other tree species are very common. In the Sudanian Zone, which covers a large part of Burkina Faso, Acacia sp and other thorny bushes are replaced gradually by other plants such as Butyrospermum parkii and Parkia biglobosa.

The Sudano-Guinean Zone covers the southwestern part of Burkina Faso. Wooded savannahs and forests are the main features of the landscape. Berlinia sp, Ficus sp, Papilionaceae, ferns, palm trees, and species of the Pandanaceae family are common.

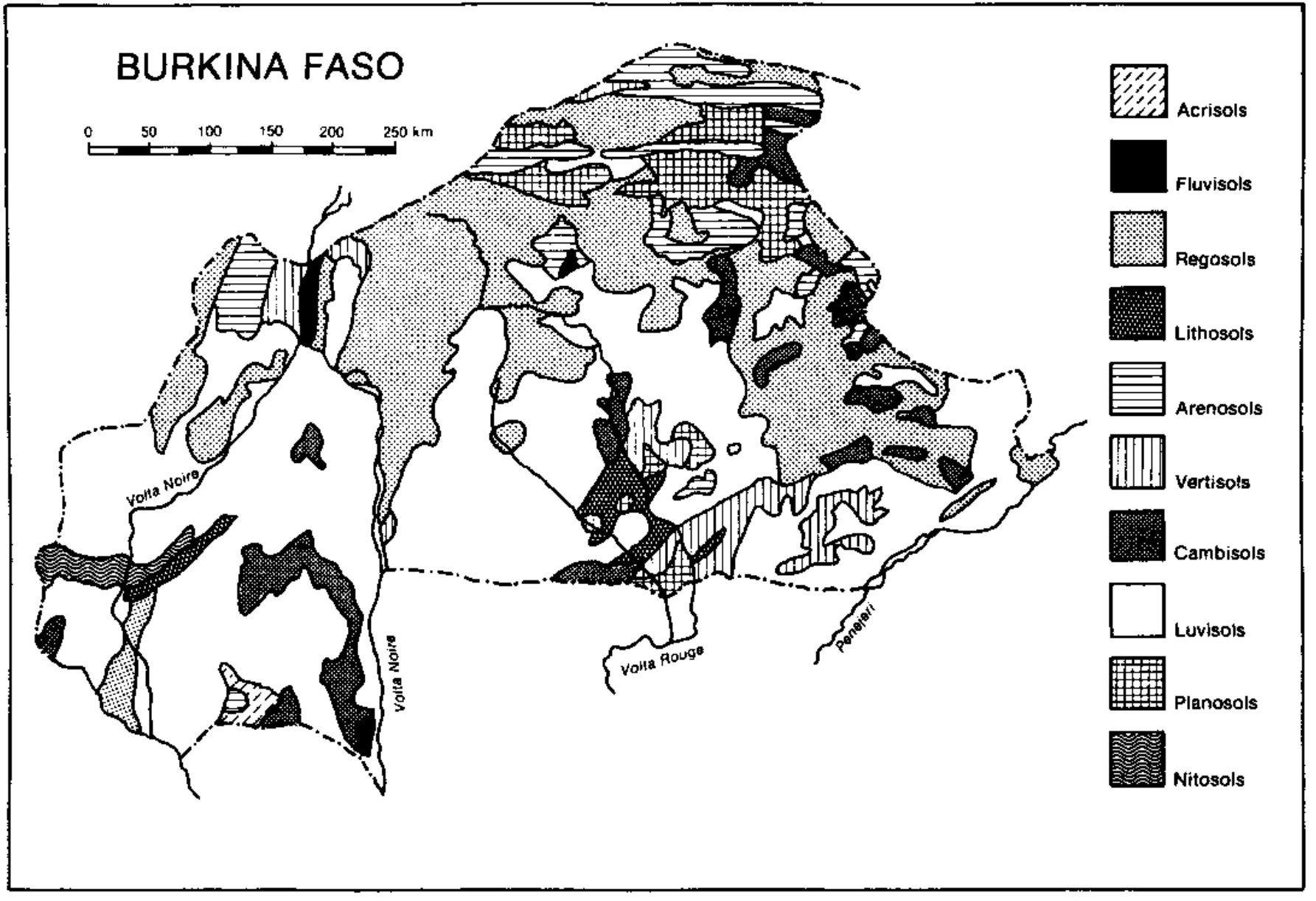


Figure 1. Soils of Burkina Faso (after FAO).

Figure 1. Sols du Burkina Faso (d'après FAO).

Agriculture and Animal Husbandry

The agricultural sector is the dominant sector of Burkina Faso's economy. The majority of Burkina Faso's population is rural. Practically all agriculture in Burkina Faso is rainfed. About 9% of the land or 2.6 million ha is cultivated each year (FAO 1981). The basic food crops–sorghum, millet, and maize–account for 82% of the cultivated area and 80% of the production.

In the northern regions of Burkina Faso, with lesser rainfall and sandy soils, millet is the dominant crop. Elsewhere, sorghum is the principal subsistence crop and is grown on 1.05 million ha (FAO 1981). In general, millet is cultivated on shallow soils with steep slopes or on poor soils where sorghum cannot be grown. Yet, in the Mossi region, millet and sorghum are grown in association on the same piece of land. In the region bounded by Hounde, Ouahigouya, Diapaga, and Tenkodogo in central Burkina Faso, the peasant farmers grow some cotton and groundnut besides cereals. Taking this region as a whole, sorghum and millet would occupy 65-85% of the cultivated land. According to Savonnet (1976), in the Fada N'Gourma and Kaya districts, the farmers devote 10-15% of their fields to groundnut and bambara groundnut for which the light soils are suitable. In favorable areas with such light soils, the groundnut plots are usually large. In the regions of Ouagadougou and Kaya, rice fields occupy 2.5% of the cultivated area. But the yields vary greatly depending upon the efficient control of water in the lowland areas.

In the region south of 11°N latitude, yams are very popular on the sandy soils around Leo and Gaoua. Yams and beans are the chief products exported from this region (Savonnet 1976). In the southwest, around Banfora, in addition to the traditional food crops, yam, maize, and rice constitute the cash crops because of the better physical environment. Towards the north, beyond Bobo-Dioulasso, the Bobo people specialize in growing groundnut, yam, sesamum, and cotton. Around Solenzo, the farmers prefer to grow cotton.

The production levels of subsistence as well as commercial agriculture vary depending upon the rainfall (amount, duration, and distribution during the rainy season), nature of the soils (depth, water-holding capacity, and texture), availability of land, cultural techniques, and the basic habits of the local people. The rainfall, which is low and highly irregular in distribution, makes agriculture and animal husbandry throughout the country susceptible to the vagaries of droughts. Even in the central and the southern Burkina Faso, where the rainfall is high and the rainy season long, the risk of drought exists. Moreover, the farmers are always weary about the short spells of drought, interspersed with violent rainstorms that follow sowing, resulting in heavy lodging of the standing crops.

The general practice of burning the bushes, which helps clear the land, makes the soil susceptible to wind erosion during the dry season and to water erosion at the start of the rainy season.

The lack of adequate tools, well adapted to the soil type and to

the type of job to be carried out, limits the area that can be potentially cultivated by the farmers. A number of sociological factors also limit the scope for innovation equally, resulting in low yields and meager incomes.

The lack of integration of agriculture and animal husbandry in a farming systems set-up is a major limiting factor. According to FAO (1979), the livestock sector contributes 27.3% to the GDP of the country. The number of cattle in Burkina Faso in 1979 was estimated at 2.7 million head, and of goats and sheep together, 4.5 million head. The share of ruminants (cattle, sheep, goats, and camels) in the total livestock population is about 89% (Jahnke 1982). Stock raising is carried out in the thinly populated area of the north and the east although a large-scale program has been started to redevelop livestock production in the west of the country (Church 1985). It is estimated that a total of 14.5 million ha are used for pasturing livestock throughout the country (Savonnet 1976).

One of the crucial problems of livestock production (Jahnke 1982) is that livestock is concentrated in the areas with the lowest ecological potential. Availability of natural bush-grass fodder, the dominant feed for cattle during most of the year, is often limited in the arid areas. As more and more land is used for cropping in the semi-arid areas, livestock are excluded from year-round grazing. However, stubbles and crop residues are provided as feed. In drought years, the lack of water coupled with shortages of feed lead to an overall reduction in the livestock populations. Trypanosomiasis, carried by tsetse flies, adversely affect livestock productivity in southern Burkina Faso and in many other areas of the country making the upkeep of domestic, particularly ruminant, livestock impossible (Jahnke 1982).

Climatic Characteristics

General atmospheric circulation

The general meteorological situation in West Africa is influenced by three permanent centers of high pressure or anticyclones: the first over the Atlantic around the Azores called the Azores Anticyclone, the second over North Africa (Libya-Sudan) called the Saharan Anticyclone, and the third over South Atlantic around St. Helene called the Southern Hemisphere Anticyclone. Burkina Faso, situated deep in continental Africa, is not influenced directly by the Azores Anticyclone but the movement and the weakening or strengthening of the Saharan and Southern Hemisphere Anticyclones influences the atmospheric circulation over the country.

The air masses over the region are controlled by the center of action, the origin, and the different characteristics following the predominance of either of the two air fluxes affecting the region–the dry air flux or Harmattan flowing from the northeast to the east due to the predominance of the Saharan anticyclone (hot during the day and cool at night), and the moist air flux or monsoon, from the southwest

to the south, due to the predominance of the Southern Hemisphere Anticyclone. The zone separating the two flows or the Inter Tropical Convergence Zone (ITCZ) oscillates north-south during the year.

The passage of the perturbations associated with the polar front over the Mediterranean and North Africa may lead to the breakdown of the vast Saharan Anticyclone favoring the passage of a low pressure trough leading to the monsoon that does not pass beyond a certain latitude. It is this situation, which is responsible for the thunderstorms that may be produced over these regions in February/March.

When similar situations are produced in the middle of the rainy season and the Southern Hemisphere Anticyclone passes widely over the continent, exceptionally long and heavy rains occur, leading to the rapid swelling of rivers and flooding. The swelling of the river Senegal and the inundation of Kayes in August 1958 are examples of such a situation.

Climatic zones in Burkina Faso

The climatic zones of Burkina Faso are:

- A Southern Sudanian Zone (above 1000 mm mean annual rainfall) covering the regions south of 11° 30'N characterized by rainfall for half of the year and a relatively low temperature throughout the year.
- A Central North Sudanian Zone (between 1000 mm and 650 mm isohyets) covering the regions situated between 11° 30' and 14°N latitude where the wet season does not exceed 6 months.
- A Northern or Sahelian Zone (below 650 mm isohyet) covering the regions north of the 14th parallel with a short rainy season, considerable variability in the rainfall distribution, severe drought due to high evapotranspiration, and high daily and annual temperature.

Data Availability

The long-term daily rainfall data available for 130 locations in Burkina Faso (Table 1) supplied to us by Institut Francais de Recherche Scientifique pour le Developpement en Cooperation (ORSTOM) were updated to 1983 in cooperation with the National Meteorological Services of the Government of Burkina Faso. The geographical locations of the stations are shown in Figure 2. The data were entered into the ICRISAT computer system (VAX 11/780) and verified.

Monthly average maximum and minimum temperature data for durations varying from 32 to 53 years for seven synoptic stations provided by the Meteorological Services of the Government of Burkina Faso, were also entered on the computer and verified.

Figure 2. Location of the rainfall stations in Burkina Faso.

Figure 2. Site des stations météorologiques au Burkina Faso.

Table 1. List of rainfall stations in Burkina Faso.

Station	Abr.	Latitude (N) ° '	Longitude ° '	Altitude (m)	Database (years)
Aribinda	ARB	14 14	52 W	370	27
Bagassi	BGS	11 45	3 18 W	280	20
Baguéra	BGR	10 32	5 25 W	315	19
Bam	BAM	13 20	1 30 W	264	34
Banankélédaga	BNK	11 19	4 20 W	329	26
Banfora	BNF	10 38	4 46 W	270	59
Bani	BNI	13 43	10 W	310	25
Baraboulé	BBL	14 13	1 51 W	308	15
Barsalogho	BSL	13 25	1 4 W	350	21
Batié	BTI	9 53	2 55 W	298	34
Béréba	BRB	11 37	3 41 W	291	16
Beregadougou	BDG	10 45	4 44 W	n.a.	4
Betare	BTR	11 26	1 22 W	305	15
Bilanga	BLG	12 33	1 W	n.a.	10
Bobo-Dioulasso	BOB	11 10	4 19 W	432	71
Bogandé	BGN	12 59	8 W	250	32
Bomborokuy	BBK	13 03	3 59 W	279	19
Bondoukuy	BDK	11 51	3 46 W	359	17
Boromo	BRM	11 45	2 56 W	264	58
Boulbi	BLB	12 14	1 32 W	315	21
Boulsa	BLS	12 39	34 W	313	22
Boura (Léo)	BRA	11 3	2 30 W	281	21
Bouroum	BRO	13 36	39 W	294	14
Bourzanga	BZG	13 41	1 33 W	329	17
Bouroum-Bouroum	BBM	10 32	3 14 W	n.a.	3
Boussé	BSS	12 40	1 53 W	345	20
Dakiri	DKR	13 17	14 W	280	18
Dano	DAN	11 9	3 4 W	290	26
Dedougou	DDG	12 28	3 28 W	308	58
Dialgaye	DGY	11 58	23 W	n.a.	7
Diapaga	DPG	12 4	1 47 E	270	50
Didyr	DDR	12 34	2 27 W	292	15
Diébougou	DBG	10 58	3 15 W	294	58
Dionkélé N'dorola	DNK	11 46	4 49 W	310	25
Dissin	DSN	10 56	2 56 W	274	15

n.a. = not available

.. contd.

Table 1 continued.

Station	Abr	Latitude (N) o '	Longitude o '	Altitude (m)	Database (years)
Djibo	DJB	14 6	1 37 W	274	29
Dori	DOR	14 2	2 W	288	60
Fada N'Gourma	FNG	12 2	22 E	292	61
Farako-Ba	FRB	11 6	4 20 W	405	27
Founzan	FZN	11 27	3 14 W	n.a.	5
Gampéla	GPL	12 26	1 21 W	n.a.	6
Gao	GAO	11 39	2 11 W	331	16
Gaoua	GAU	10 20	3 11 W	333	66
Garango	GRN	11 48	34 W	275	33
Gonboussougou	GBS	11 24	46 W	n.a.	12
Gonsé	GNS	12 27	1 19 W	n.a.	6
Gorgadji	GRD	14 2	31 W	302	24
Gorom-Gorom	GRM	14 27	14 W	380	24
Houndé	HND	11 29	3 31 W	324	59
Imansgho	ING	12 26	2 20 W	282	21
Kakoumana	KMN	10 15	4 56 W	334	18
Kamboinsé	KMB	12 28	1 33 W	300	26
Kampti	KMP	10 8	3 28 W	340	26
Kantchari	KTR	12 28	1 31 E	270	37
Kassoum	KSM	13 5	3 18 W	260	16
Kaya	KYA	13 6	1 5 W	313	61
Kiembara	KBR	13 15	2 43 W	295	16
Kindi	KDI	12 26	2 2 W	332	17
Kokologo	KKL	12 11	1 53 W	315	17
Kombissiri	KBS	12 4	1 20 W	275	25
Komin-Yanga	KYG	11 44	8 E	267	18
Korsimoro	KMR	12 49	1 4 W	292	16
Kossougoudou	KGD	12 56	14 W	295	20
Kotoura	KTA	10 58	5 17 W	n.a.	3
Koudougou	KDG	12 15	2 22 W	250	61
Koumbia	KBA	11 14	3 42 W	309	16
Koupéla	KPL	12 11	21 W	275	57
Kourouma	KRM	11 37	4 48 W	347	20
Kpwayes	KPY	11 7	2 55 W	n.a.	6
Lantaogo	LTG	12 1	5 W	325	24

n.a. = not available .. contd.

Table 1 continued.

Station	Abr.	Latitude (N) o '	Longitude o '	Altitude (m)	Database (years)
Legmoin	LMN	10 9	2 54 W	345	19
Léo	LEO	11 6	2 6 W	347	61
Loumana	LMA	10 35	5 21 W	320	20
Mahadaga	MDG	11 42	1 45 E	225	18
Mané	MNE	12 59	1 20 W	283	18
Manga	MNG	11 40	1 4 W	286	31
Mangodara	MGD	9 54	4 21 W	260	19
Markoye	MRY	14 38	4 E	295	25
Matiakouali	MKL	12 22	1 2 E	295	19
Mogtédo	MTD	12 17	50 W	272	15
Namounou	NMN	11 52	1 42 E	274	20
Nanoro	NNR	12 41	2 11 W	312	21
Nasso	NSS	11 12	4 26 W	335	27
Niangoloko	NNG	10 16	4 55 W	320	29
Niaogho	NGH	11 46	46 W	230	19
Nouna	NNA	12 44	3 52 W	280	39
Orodara	ORD	10 59	4 55 W	523	26
Ouagadougou	OGD	12 22	1 31 W	296	65
Ouahigouya	OHG	13 35	2 26 W	329	60
Ouargaye	ORG	11 32	1 E	285	22
Ouarkoye	OKY	12 5	3 40 W	315	19
Ouo	OUO	10 24	3 50 W	330	15
Pabré	PBR	12 31	1 34 W	295	26
Pama	PAM	11 15	42 E	230	31
Piela	PLA	12 42	8 W	290	20
Po	PO	11 10	1 9 W	326	38
Pobé	PBE	13 54	1 46 W	330	16
Réo	REO	12 19	2 22 W	228	21
Saba	SAB	12 22	1 25 W	300	26
Safane	SFN	12 8	3 13 W	318	20
Samo Rogouan	SRG	11 24	4 56 W	380	16
Sapouy	SPY	11 33	1 46 W	330	21
Saria	SRA	12 16	2 9 W	300	36
Sébba	SBA	13 26	31 E	212	25
Séguénéga	SGG	13 26	1 58 W	307	24

n.a. = not available .. contd.

Table 1 continued.

Station	Abr.	Latitude (N) ° '	Longitude ° '	Altitude (m)	Database (years)
Sideradougou	SDR	10 41	4 15 W	319	25
Silmidougou	SDG	13 2	1 26 W	n.a.	5
Sindou	SDU	10 40	5 10 W	n.a.	11
Solenzo	SLZ	12 11	4 5 W	315	20
Soubakaniédougou	SKD	10 29	5 1 W	335	17
Sourou/Gassan	SRU	12 49	3 13 W	265	16
Tanghin-Dassouri	TDS	12 16	1 43 W	353	13
Tansilla	TSL	12 25	4 23 W	430	17
Tema	TMA	13 3	1 46 W	314	18
Tenkodogo	TNK	11 46	23 W	302	59
Thiou (Ouahigouya)	THU	13 49	2 40 W	303	15
Thyou (Koudougou)	THY	11 57	2 12 W	336	17
Tikaré	TKR	13 17	1 44 W	400	21
Tiogo	TGO	12 11	2 41 W	274	16
Titao	TTO	13 46	2 4 W	319	17
Toéni	TNE	13 26	3 11 W	262	15
Toma	TMA	12 46	2 54 W	289	17
Tougan	TGN	13 5	3 4 W	305	59
Tougouri	TGR	13 19	30 W	280	27
Wona	WNA	11 58	3 26 W	340	17
Yako	YKO	12 58	2 16 W	294	38
Yamba	YBA	12 18	20 E	n.a.	9
Zabré	ZBR	11 10	36 W	296	26
Zorgo	ZRG	12 15	37 W	315	24

n.a. = not available

Monthly average solar radiation, temperatures, relative humidity, and wind speed from 1969 to 1981 for the computation of the Penman potential evapotranspiration (PE) were made available for eight locations by the Meteorological Services of the Government of Burkina Faso. These data were used to compute PE for use in water-balance simulation for the eight locations.

Annual Rainfall

The mean annual rainfall in Burkina Faso is shown in Figure 3. The isohyets more or less run parallel, reflecting the dominating influence of the north-south movement of the ITCZ on the rainfall patterns across the country. The mean annual rainfall exceeds 1000 mm on the western side of the Southern Sudanian Zone, south of 11° 30'N latitude covering the region comprising of Orodara, Banfora, Bobo-Dioulasso, Sideradougou, Kampti, Gaoua, and Batie. In the extreme south at Niangoloko, the mean annual rainfall recorded is 1284 mm, the highest in the country. However, the eastern side of the Southern Sudanian Zone covering the region east of Diebougou, Honde comprising Leo, Po, Zabre, and Pama differs from the western side in that the mean annual rainfall is less than 1000 mm. These differences in the isohyetal patterns in Burkina Faso, as in the case of Niger (Sivakumar et al. 1980) and Mali (Sivakumar et al. 1984), may be due to the greater amplitude and therefore swifter passage of the ITCZ in the east than in the west, and due to habitual large-scale convergence.

In the Central North Sudanian Zone situated between 11° 30' and 14°N latitude, covering a large part of the country, the mean annual rainfall ranges from 500 mm to 1000 mm with the rainfall decreasing as one moves north. In the Sahelian Zone north of 14°N latitude, the mean annual rainfall is below 500 mm.

The annual rainfall in Burkina Faso varies considerably from year to year, a very common characteristic in the semi-arid tropics. Even in the Southern Sudanian Zone, where the mean annual rainfall is the highest in the country, the interyear variations are large. In order to depict the variation in the annual rainfall of Burkina Faso, nine locations with database covering 1920-84 have been chosen. The choice of these locations was based on the need to characterize the nature of variation in the annual rainfall in the Sahelian, the Central North Sudanian, and the Southern Sudanian Zones.

The annual rainfall at Dori in the Sahelian Zone (14° 2'N) from 1920 to 1984 is shown in Figure 4. The lowest annual rainfall of 244 mm was recorded in 1926 while the highest annual rainfall in the past 65 years was 784 mm, received in 1953. At Kaya, located at 13° 6'N latitude in the Central North Sudanian Zone, the mean annual rainfall is 696 mm. The interannual variations at Kaya (Fig. 5) show that fluctuations of annual rainfall around the mean reflect no periodicity. Dedougou (12° 28'N), Ouagadougou (12° 22'N), and Fada N'Gourma (12° 2'N) are more or less located on the same transect in the Central North Sudanian Zone. However, the variation in the annual rainfall (Figs. 6-9) is not similar at the three locations. For example, at Dedougou, located on the western end, during the 30-year period cover-

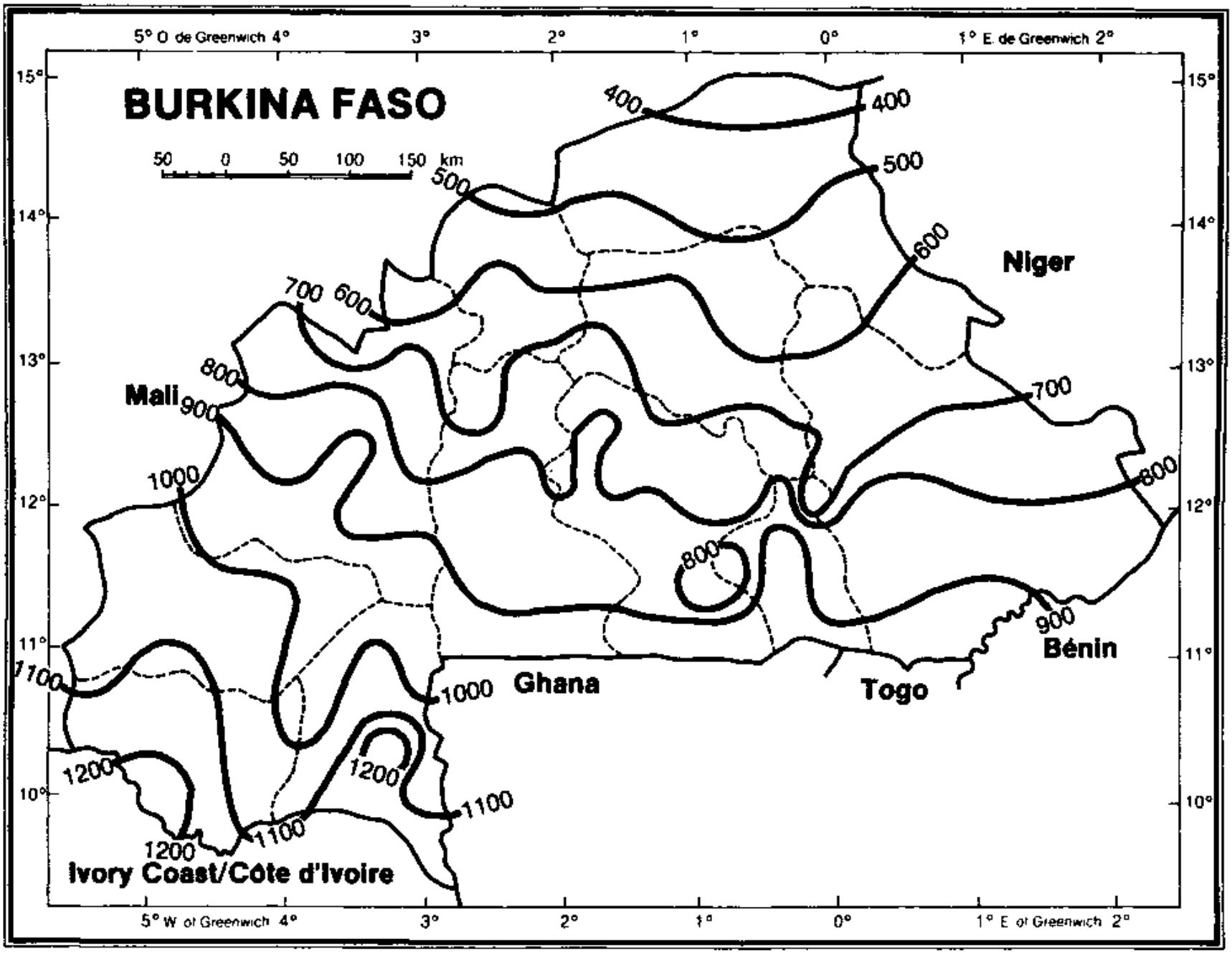


Figure 3. Mean annual rainfall in Burkina Faso.

Figure 3. Pluviométrie annuelle moyenne au Burkina Faso.

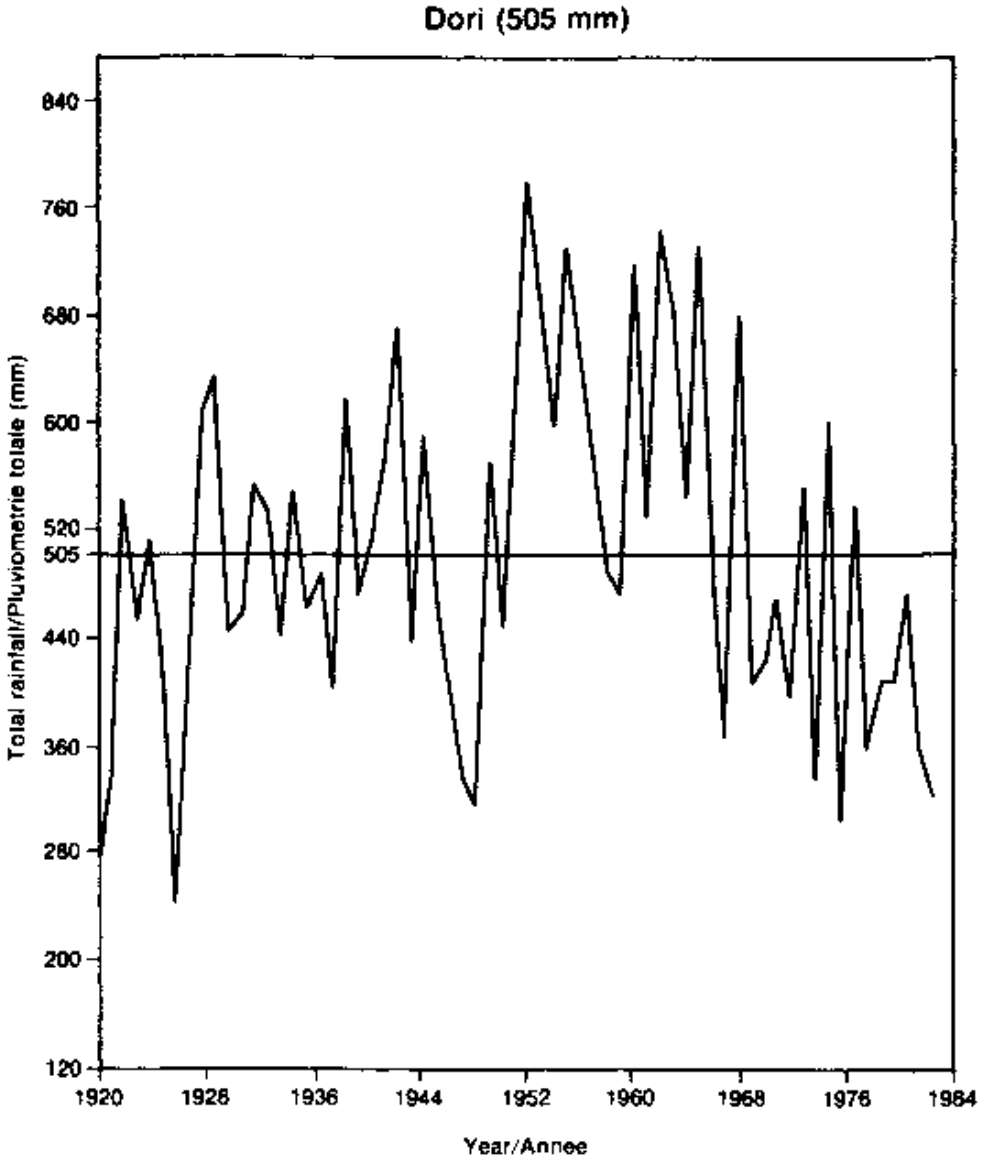


Figure 4. Annual rainfall variation at Dori (mean=505 mm).

Figure 4. La variation de la pluviométrie annuelle à Dori (moyenne=505 mm).

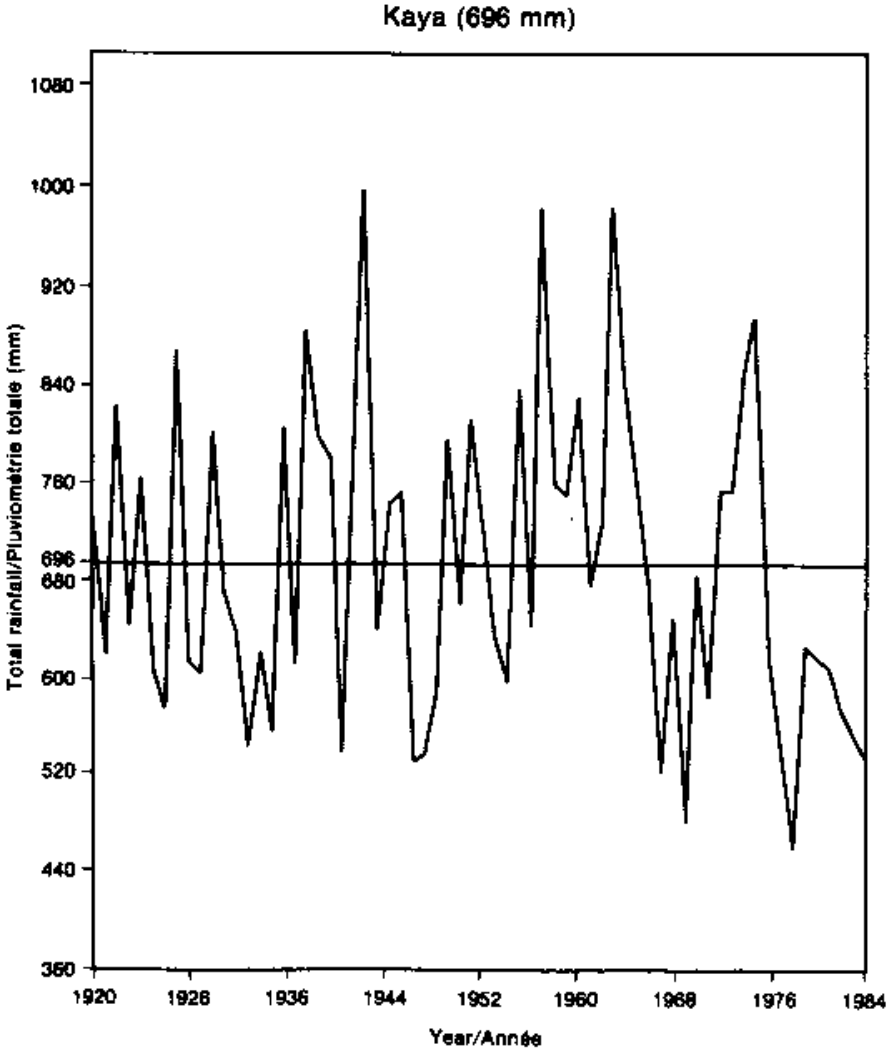


Figure 5. Annual rainfall variation at Kaya (mean=696 mm).

Figure 5. La variation de la pluviométrie annuelle à Kaya (moyenne=696 mm).

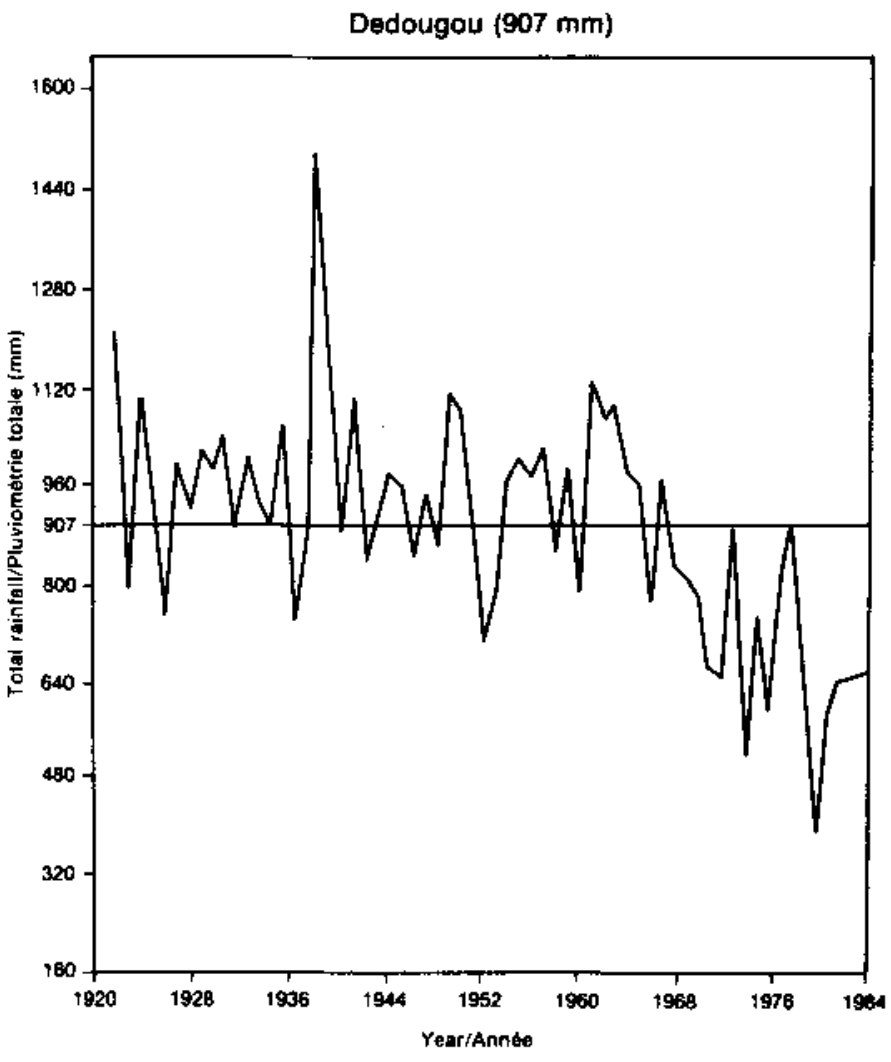


Figure 6. Annual rainfall variation at Dedougou (mean=907 mm).

Figure 6. La variation de la pluviométrie annuelle à Dédougou (moyenne=907 mm).

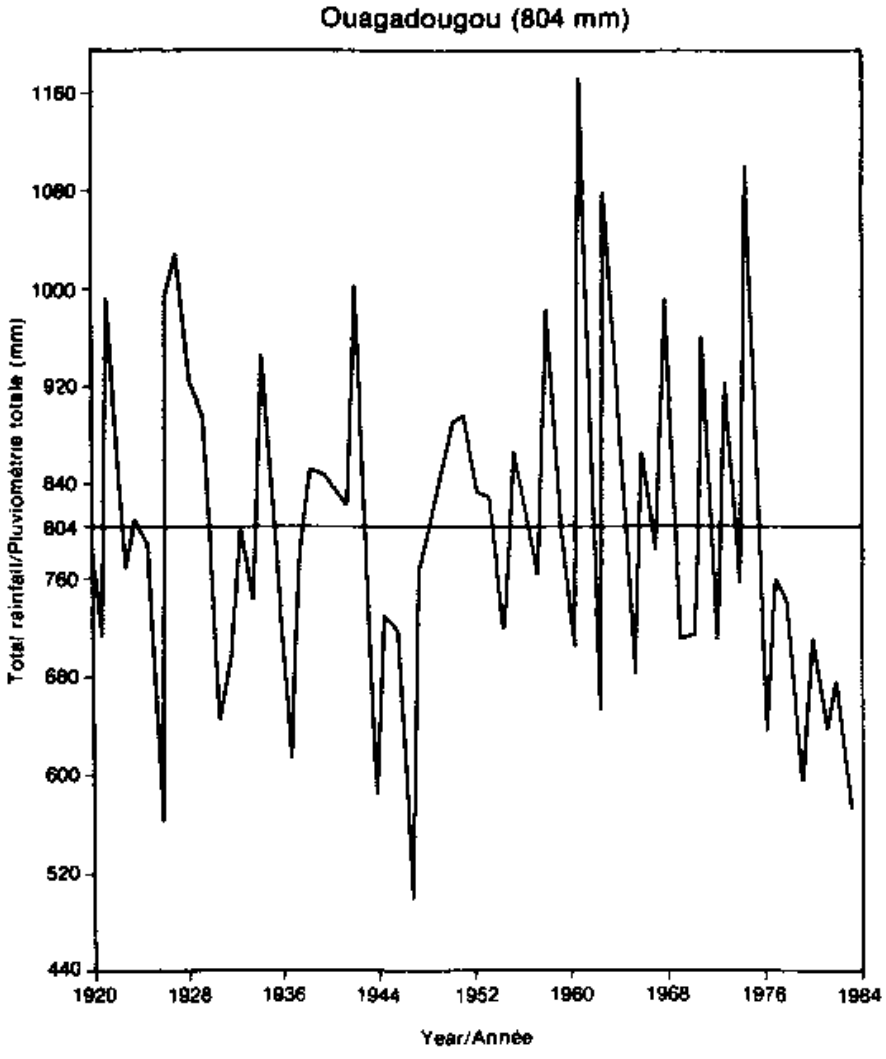


Figure 7. Annual rainfall variation at Ouagadougou (mean=804 mm).

Figure 7. La variation de la pluviométrie annuelle à Ouagadougou (moyenne=804 mm).

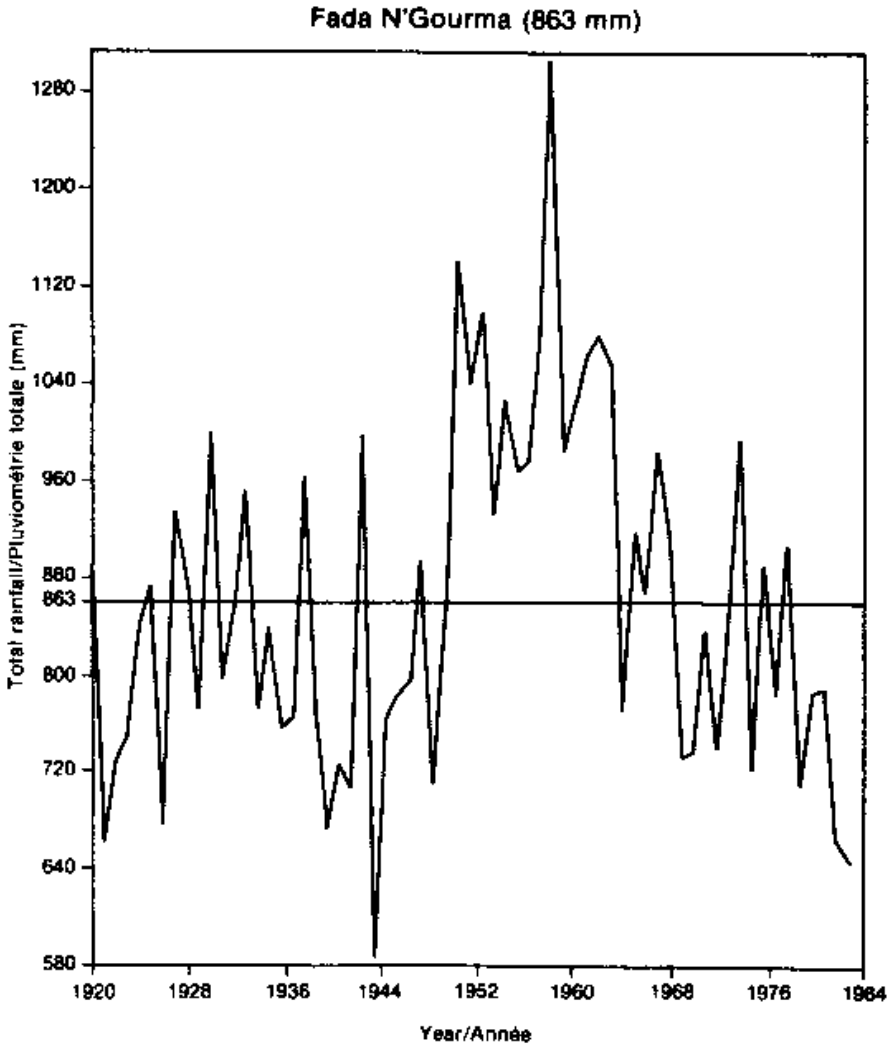


Figure 8. Annual rainfall variation at Fada N'Gourma (mean=863 mm).

Figure 8. La variation de la pluviométrie annuelle à Fada N'Gourma (moyenne=863 mm).

ing 1922-52, only 3 years recorded annual rainfall below 800 mm (Fig. 6). However, at Fada N'Gourma during the same period (Fig. 8) there were several years when the annual rainfall decreased below 700 mm. Conversely at Fada N'Gourma, the annual rainfall during 1951-64 was consistently above the mean rainfall of 863 mm while at Dedougou during the corresponding period, 4 years recorded rainfall below normal. Similarly, Bobo-Dioulasso (11° 10'N) and Leo (11° 6'N) are located approximately on the same latitude but the rainfall patterns at these two locations are not similar (Figs. 9 and 10). During 1925-35, the rainfall at Bobo-Dioulasso was above the normal rainfall of 1111 mm. However, at Leo (normal rainfall 981 mm) during the same period, the rainfall pattern was different. The lowest annual rainfall at Bobo-Dioulasso was recorded in 1921 while at Leo the lowest rainfall of 625 mm was recorded in 1978. Comparison of annual rainfall at Banfora (Fig. 11) and Gaoua (Fig. 12), both located in the Southern Sudanian Zone, also reveals differences in the temporal distribution of rainfall.

In the rainfall patterns shown for the nine locations in Figures 4-12, the decrease in the mean annual rainfall during 1969-79 was quite consistent across the locations except at Ouagadougou. Extended periods of either above- or below-normal rainfall for periods other than 1969-79 were also evident at some locations but were not consistent across locations, for example, above normal rainfall during 1952-66 at Dori, during 1951-64 at Fada N'Gourma, and during 1922-41 at Ouagadougou; while rainfall was below normal during 1944-54 at Gaoua, and during 1939-49 at Banfora.

To verify the influence of the decreased rainfall during 1969-79, on the long-term average, the period from 1920 to 1984 for the nine stations described above was divided into 1920-50 and 1951-84, and monthly and annual averages were computed for the three periods, i.e., 1920-84, 1920-50, and 1951-84. The results shown in Table 2 indicate no consistent changes in the computed means across the nine locations. However, Dedougou, Bobo-Dioulasso, Banfora, and Gaoua–all located in the western end of the Northern and Southern Sudanian Zones–showed lower mean annual rainfall during the period 1951-84 as compared with the other two periods. The decrease in mean annual rainfall during 1951-84 from the mean of 1920-50 was in excess of 100 mm at Dedougou and Gaoua. For the other five locations, i.e., Dori, Fada N'Gourma, Leo, Kaya, and Ouagadougou, the mean annual rainfall during 1951-84 was higher. These data show that the averages computed for the most-recent years could vary from the previous averages depending upon the location, but a generalized statement regarding decreased normal rainfall in Burkina Faso as a whole cannot be valid.

As shown in Table 3 for selected locations in Burkina Faso, the maximum and the minimum rainfall recorded are quite variable. For example, at Batie, a location in the Southern Sudanian Zone, the minimum rainfall recorded is lower than the maximum recorded at Djibo situated in the Sahelian Zone.

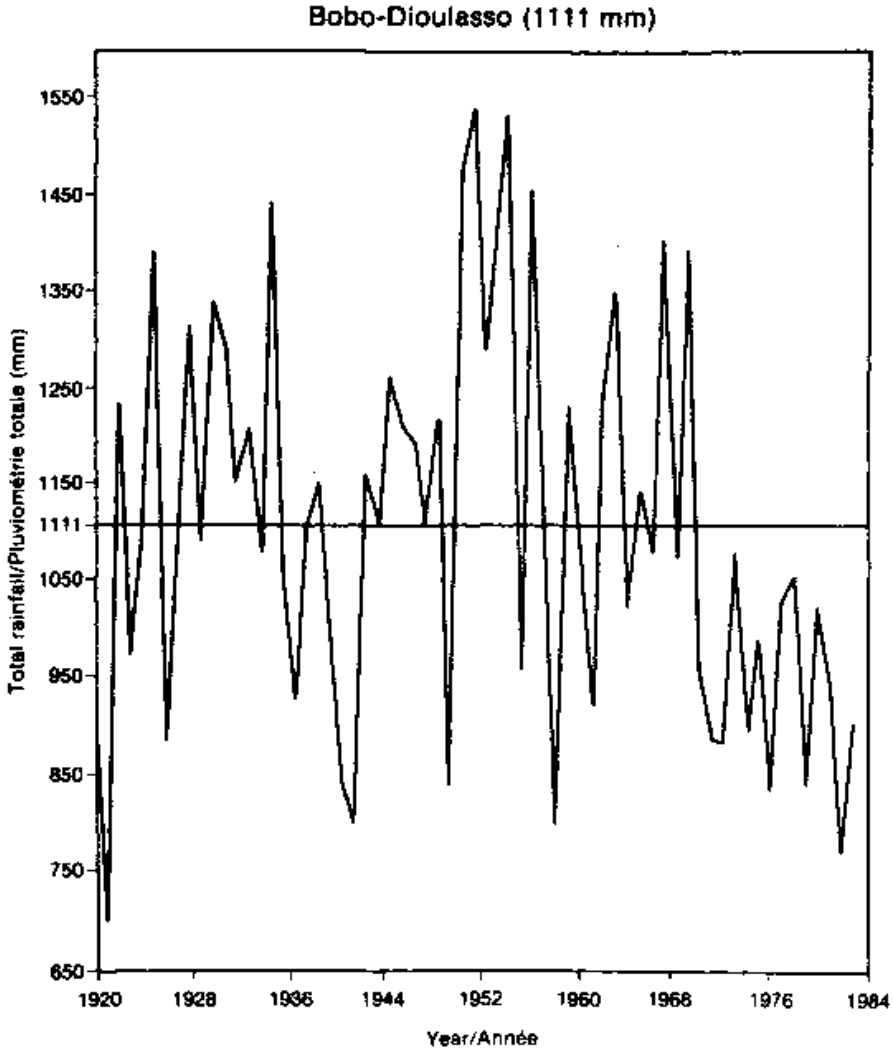


Figure 9. Annual rainfall variation at Bobo-Dioulasso (mean=1111 mm).

Figure 9. La variation de la pluviométrie annuelle à Bobo-Dioulasso (moyenne=1111 mm).

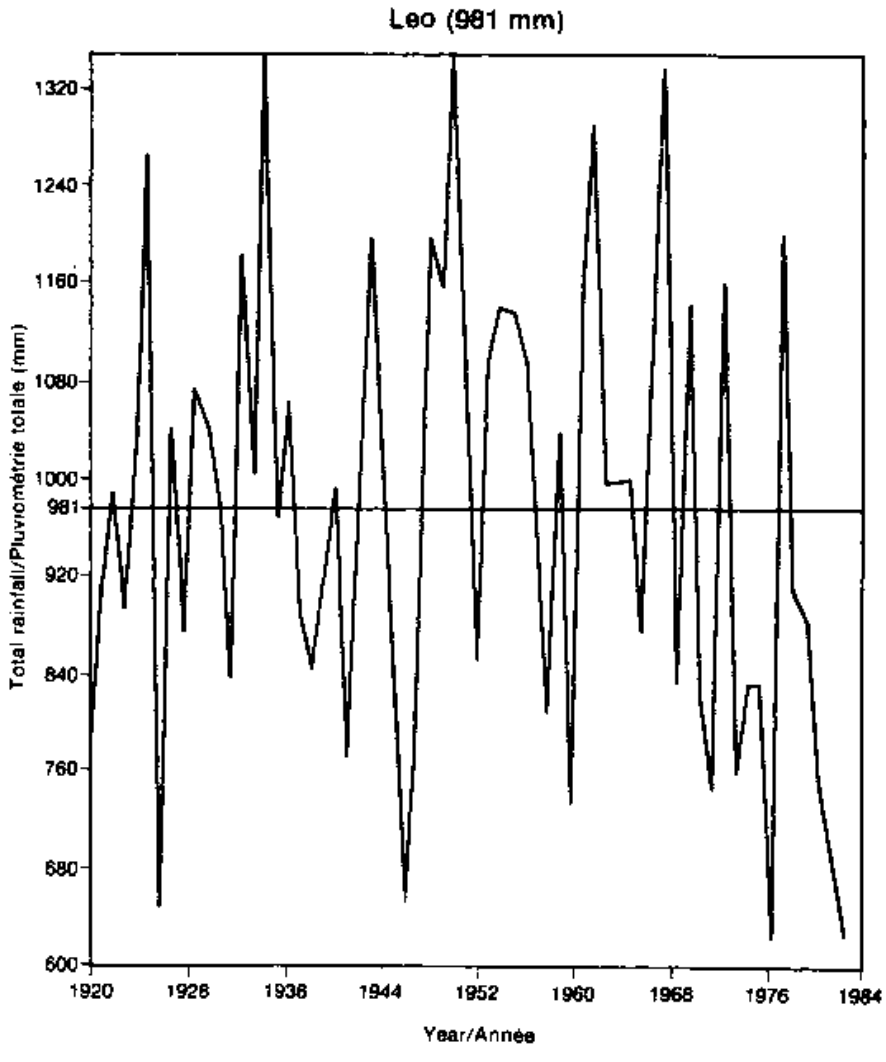


Figure 10. Annual rainfall variation at Léo (mean=981 mm).

Figure 10. La variation de la pluviométrie annuelle à Léo (moyenne=981 mm).

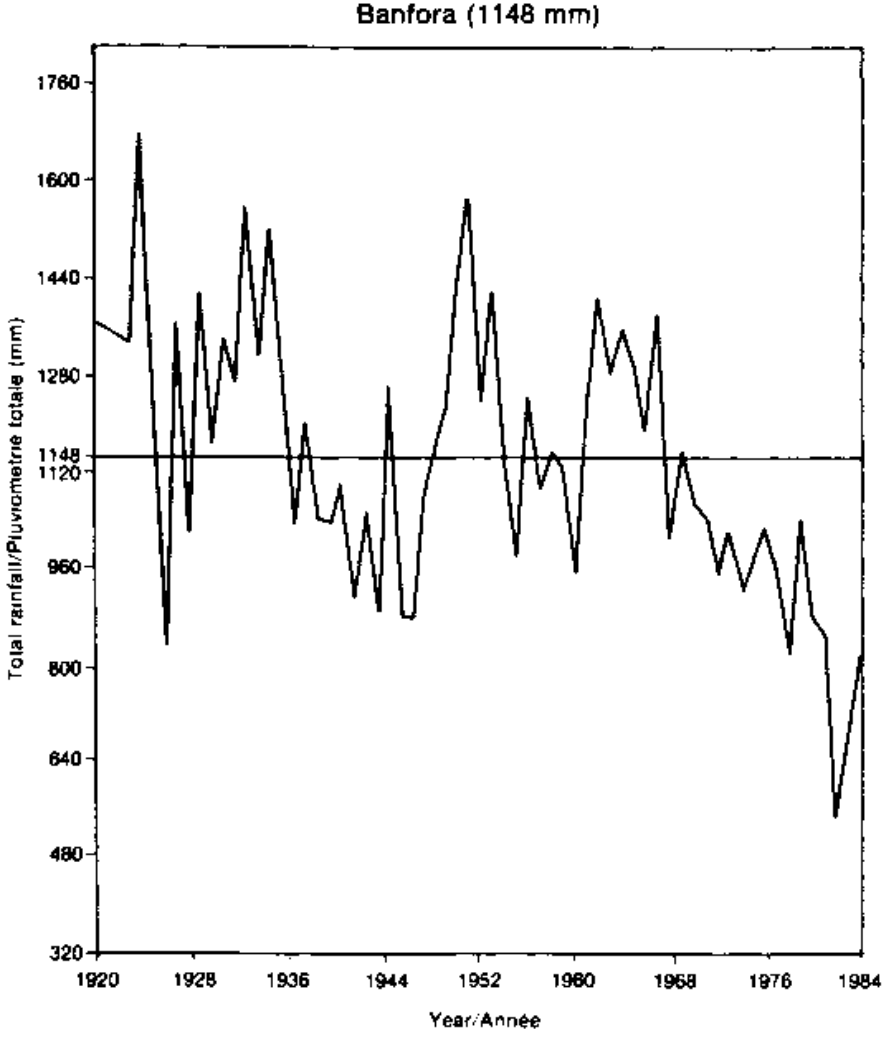


Figure 11. Annual rainfall variation at Banfora (mean=1148 mm).

Figure 11. La variation de la pluviométrie annuelle à Banfora (moyenne=1148 mm).

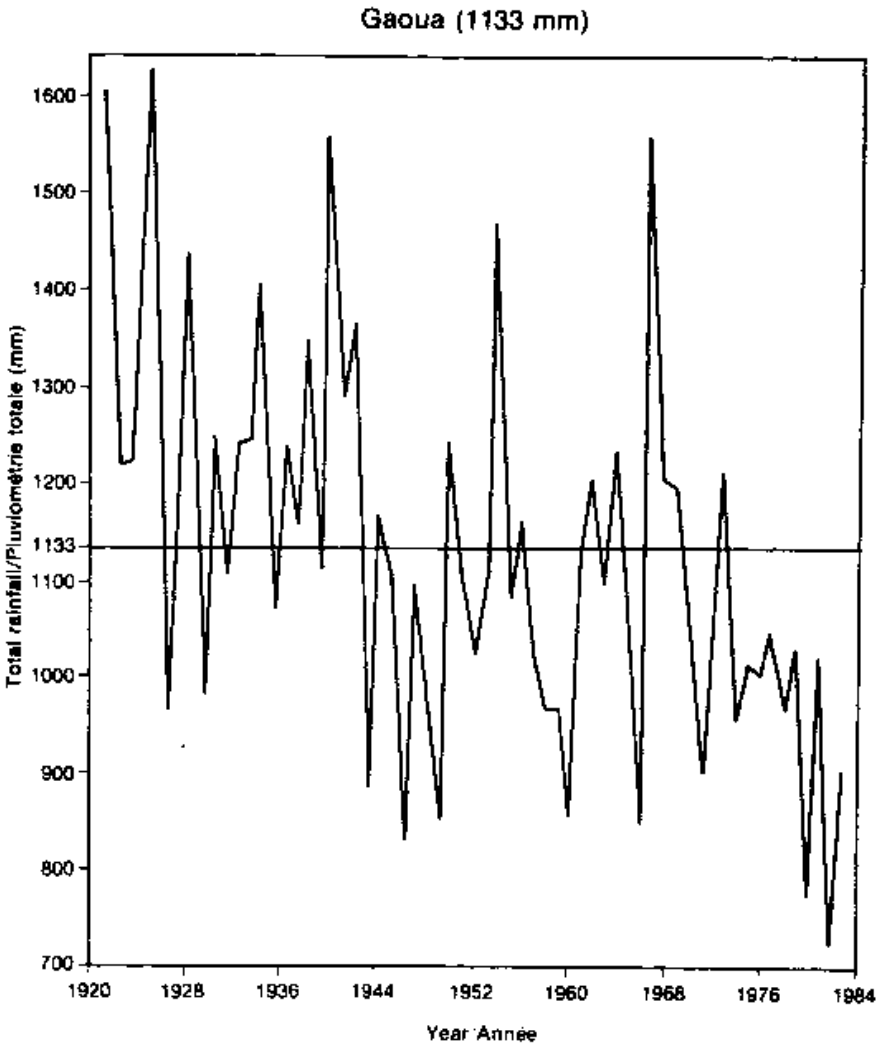


Figure 12. Annual rainfall variation at Gaoua (mean=1133 mm).

Figure 12. La variation de la pluviométrie annuelle à Gaoua (moyenne=1133 mm).

Table 2. Fluctuations of average monthly and annual rainfall (mm) during three periods (1) 1920-84, (2) 1920-50, and (3) 1951-84 for nine stations in Burkina Paso.

Station	Period	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Dedougou	(1)	1	1	6	25	68	116	209	265	159	49	3	0	907
	(2)	2	1	7	29	71	123	230	285	170	56	4	0	983
	(3)	0	1	5	22	65	110	193	249	150	44	2	0	847
Banfora	(1)	1	5	19	62	110	140	208	300	205	71	18	3	1148
	(2)	0	3	22	58	114	149	208	322	213	78	24	1	1197
	(3)	1	7	17	65	107	133	207	282	199	66	14	4	1109
Bobo-Dioulasso	(1)	0	3	18	48	107	130	217	302	199	70	10	1	1111
	(2)	0	3	17	49	103	136	219	303	191	76	13	1	1119
	(3)	1	3	19	47	110	125	214	302	206	65	7	1	1104
Dori	(1)	0	0	1	5	23	62	133	174	85	16	0	0	505
	(2)	1	0	0	4	23	50	125	168	81	19	1	0	475
	(3)	0	0	2	5	24	72	139	180	89	14	0	0	530
Fada N'Gourma	(1)	0	1	7	25	80	124	182	251	157	29	2	0	863
	(2)	0	1	5	25	77	129	166	243	132	21	3	0	805
	(3)	0	0	9	25	82	120	196	259	178	36	0	1	912
Gaoua	(1)	3	6	32	72	132	144	183	229	212	90	19	5	1133
	(2)	1	8	35	66	146	155	188	259	237	97	27	2	1227
	(3)	3	5	31	77	121	136	179	205	191	85	12	8	1058
Leo	(1)	1	2	16	53	97	123	185	249	190	51	8	2	981
	(2)	2	0	13	59	89	127	174	238	200	54	9	1	971
	(3)	0	3	19	47	105	120	194	259	181	49	6	2	990
Kaya	(1)	0	0	3	9	46	98	160	229	120	25	2	0	696
	(2)	0	0	1	10	52	96	150	229	118	29	4	0	693
	(3)	0	0	5	8	41	100	169	229	121	21	0	0	699
Ouaga-dougou	(1)	0	1	5	20	69	108	179	246	137	30	3	0	804
	(2)	0	0	4	17	61	107	176	251	125	28	3	0	777
	(3)	0	1	6	22	78	108	176	235	143	32	2	0	808

Table 3. Maximum and minimum annual rainfall and coefficient of variation (CV) at selected locations in Burkina Faso.

Station	Mean annual rainfall (mm)		CV (%)
	Maximum	Minimum	
Batie'	1838	718	23
Diebougou	1884	282	23
Pama	1258	586	17
Ouahigouya	971	413	30
Dedougou	1519	396	20
Tougan	1210	318	21
Koudougou	1229	503	21
Kaya	1008	458	18
Tenkodogo	1528	194	24
Fada N'Gourma	1313	569	17
Diapaga	1315	498	19
Djibo	784	262	25
Markoye	684	216	27

Table 4. Frequency distribution and important statistics of annual rainfall data for 130 stations in Burkina Faso.

Frequency class (mm)	No. of stations	Percentage of total
400-500	5	3.8
500-600	13	10.0
600-700	17	13.1
700-800	22	16.9
800-900	23	17.7
900-1000	25	19.3
1000-1100	13	10.0
1100-1200	10	7.7
1200-1300	2	1.5
Total	130	100.0

Mean annual rainfall: 831 mm
Standard deviation: 189 mm
CV: 23%

Maximum rainfall: 1284 mm
Minimum rainfall: 406 mm
Range: 878 mm

The mean annual rainfall patterns in the different climatic zones of Burkina Faso when viewed in the form of frequency distribution (Table 4) show a large standard deviation and a high coefficient of variation (CV). The mean annual rainfall for the country as a whole is 831 mm with a CV of 23%. About 55% of the 130 stations investigated fall in the frequency class of 800-1200 mm.

Seasonal Rainfall

The movement of humid air starts in the southwest (Gaoua, Banfora, and Bobo-Dioulasso regions), extends to the east, and to the southeast (Pama and Diapaga regions). Intermittant rains occur in April and become regular in June. It causes widespread rainfall and local rainstorms, which then move westward from the east (Editions Jeune Afrique 1975).

The beginning and the end of the rainy season may be distinguished from the peak period by the more violent, short but heavy rainstorms, and gusts of wind reaching 120 km h^{-1}. In the beginning of the rainy season, the impact of this rainfall and the runoff that results from it erode the soil, already made bare by the bush fire.

Viewed in terms of the water availability for agriculture, the rainfall occurrences in the country can be classified broadly into a prehumid period, the wet season, and a posthumid period. This is followed by a dry season that extends from October to April. Based on the probability of occurrence of 10 mm of rainfall in 2 consecutive decades, the rainfall data during the year for each station in Burkina Faso were divided into dry season (probabilities less than 16%), prerainy or postrainy season (probabilities from 16% to 45%), and rainy season (probabilities exceeding 46%). The seasonal distribution of rainfall at different locations in Burkina Faso is given in Table 5. The rainfall received during the rainy season varies from 356 mm at Markoye in the Sahelian Zone to 1165 mm at Niangoloko in the Southern Sudanian Zone.

The rainfall pattern during the rainy season in Burkina Faso (Fig. 13) follows closely the pattern shown earlier for mean annual rainfall (Fig. 3). As in most of the semi-arid areas, over 80% of the annual rainfall is received during a short rainy season covering 3-5 months (May to September) across the country emphasizing the monomodal nature of the rainfall.

The length of the rainy season in Burkina Faso (Fig. 14) varies according to the latitudinal position of a given location. In the Sahelian Zone, the rainy season is short and varies up to 120 days. In the Central North Sudanian Zone, the length of the rainy season varies from 120 to 160 days while in the Southern Sudanian Zone it varies from 160 to 220 days depending upon the position of a location, i.e., on the eastern or western end. For example at Farako-Ba (11° 6'N), located on the western side of the Southern Sudanian Zone, the length of the rainy season is 190 days while at Po (11° 10'N) on the eastern side it is 170 days.

Table 5. Seasonal rainfall distribution (mm) in Burkina Faso.

Station	Prerainy	Rainy	Postrainy	Dry	Total
Aribinda	28.9	413.5	30.4	11.1	483.9
Bagassi	34.7	859.9	12.6	20.7	927.9
Baguera	18.4	1093.2	6.0	19.9	1137.5
Bam	15.4	585.2	21.1	20.3	642.0
Banankeledaga	677.0	967.5	24.4	8.8	1068.4
Banfora	15.2	1083.5	16.3	17.1	1132.1
Bani	50.1	488.6	11.7	26.1	576.5
Baraboule	23.1	410.6	22.8	16.3	472.8
Barsalogho	54.9	519.2	15.6	17.4	607.1
Batie	28.2	1103.0	15.9	15.2	1162.3
Bereba	34.9	836.8	21.3	17.9	910.9
Betare	6.9	839.8	9.7	28.2	884.6
Bobo-Dioulasso	17.7	1001.9	24.3	20.1	1064.0
Bogande	25.3	564.4	18.3	23.9	631.9
Bomborokuy	34.5	674.4	7.8	18.5	735.2
Bondoukuy	30.2	790.0	12.8	25.7	858.7
Boromo	15.3	901.4	10.2	21.5	948.4
Boulbi	26.6	724.1	17.0	14.4	782.1
Boulsa	12.1	693.0	19.8	21.6	746.5
Boura (Leo)	18.7	867.9	34.6	13.4	934.6
Bouroum	57.5	432.9	20.4	16.0	526.7
Bourzanga	15.4	538.7	28.8	4.6	587.5
Bousse	23.2	646.0	22.3	19.3	710.8
Dakiri	33.5	512.0	6.0	14.4	565.9
Dano	39.6	873.2	18.7	16.4	947.9
Dedougou	22.8	860.0	9.1	15.8	907.7
Dialgaye	48.9	710.4	29.2	27.5	816.0
Diapaga	9.4	789.1	30.7	15.3	844.5
Didyr	26.2	588.8	17.3	53.3	685.6
Diebougou	39.8	966.3	21.6	14.8	1042.5
Dionkele	23.8	979.1	14.7	14.9	1032.5
Dissin	11.8	921.2	48.4	14.5	995.9
Djibo	28.8	424.9	37.0	17.2	507.9
Dori	34.2	435.4	16.3	11.9	497.8
Fada N'Gourma	16.9	814.8	15.7	6.3	853.7
Farako-Ba	47.0	1015.8	9.7	8.5	1081.0
Gao	29.8	778.5	11.8	9.3	829.4

..contd.

Table 5 continued.

Station	Prerainy	Rainy	Postrainy	Dry	Total
Gaoua	9.9	1164.8	18.5	20.1	1213.3
Garango	21.7	783.3	40.0	25.5	870.5
Gorgadji	13.0	430.9	20.1	10.4	474.4
Gorom	6.4	418.3	18.5	17.4	460.6
Hounde	22.1	904.3	21.0	18.7	966.1
Imansgho	29.1	726.6	26.2	18.4	800.7
Kakoumana	122.1	932.2	58.8	23.7	1136.8
Kamboinse	34.2	751.7	18.9	21.3	826.1
Kampt i	20.6	1070.1	18.4	17.7	1126.8
Kantchari	14.9	730.6	26.7	9.9	782.1
Kassoum	31.4	591.0	24.2	7.6	654.2
Kaya	26.4	625.5	26.7	10.4	689.0
Kiembara	26.3	541.6	30.7	8.2	606.8
Kindi	26.0	717.0	32.6	9.8	785.4
Kokologo	31.5	744.8	8.9	25.9	811.1
Kombissiri	29.4	765.6	31.3	11.8	838.1
Komin-Yanga	28.2	821.2	18.4	9.1	876.9
Korsimoro	23.1	643.5	10.8	14.0	691.4
Kossougoudou	32.7	555.1	37.7	13.6	639.1
Koudougou	29.7	755.9	26.2	14.1	825.9
Koumbia	54.4	899.3	8.2	22.5	984.4
Roupela	19.7	751.0	34.1	16.3	821.1
Kourouma	26.9	956.1	21.0	14.4	1018.4
Lantaogo	27.7	599.2	10.6	17.8	655.3
Legmoin	29.3	983.1	8.2	17.2	1037.8
Leo	19.5	893.2	27.6	20.0	960.3
Loumana	32.9	1076.4	11.9	13.2	1134.4
Mahadaga	30.3	839.5	19.7	27.6	917.1
Mane	41.6	577.9	24.0	14.5	658.0
Manga	28.0	818.9	29.7	8.7	885.3
Mangodara	18.0	1025.9	19.5	21.5	1084.9
Markoye	13.0	335.1	25.2	18.9	392.2
Matiakouali	14.3	750.7	16.9	14.1	796.0
Mogtedo	33.9	682.5	42.3	12.2	770.9
Namounou	22.0	770.6	34.9	12.0	839.5
Nanoro	8.8	649.9	19.8	20.1	698.6
Nasso	30.9	1043.5	12.9	10.8	1098.1
Niangoloko	63.3	1147.5	16.4	18.0	1245.2
Niaogho	22.3	716.7	19.9	13.7	772.6
Nouna	20.6	767.7	7.3	18.5	814.1

•••contd•

Table 5 continued••

Station	Prerainy	Rainy	Postrainy	Dry	Total
Orodara	48.0	1079.7	21.9	11.1	1160.7
Ouagadougou	19.8	776.3	17.0	14.6	827.7
Ouahigouya	22.9	626.6	29.8	9.6	688.9
Ouargaye	28.7	790.8	23.7	11.2	854.4
Ouarkoye	32.6	873.9	4.9	34.2	945.6
Ouo	47.0	878.0	48.7	18.8	992.5
Pabre	26.7	746.7	17.3	14.9	805.6
Pama	46.0	878.9	17.8	11.0	953.7
Piela	68.0	591.3	26.8	11.7	697.8
Po	30.3	857.1	26.1	15.3	928.8
Pobe	22.8	445.0	21.7	21.8	511.3
Reo	18.3	735.0	26.2	16.9	796.4
Saba	63.2	726.5	19.2	22.5	831.4
Safane	23.3	775.3	30.8	23.7	853.1
Samo Rogouan	36.5	1029.6	10.7	19.5	1096.3
Sapouy	27.4	788.4	19.7	8.4	843.9
Saria	22.5	769.4	17.2	10.5	819.6
Sebba	26.6	556.7	32.6	11.7	627.6
Seguenega	25.2	617.4	11.0	16.2	669.8
Sideradougou	30.1	1016.1	15.3	10.4	1071.9
Solenzo	31.6	835.6	26.0	16.1	909.3
Soubakaniedougou	36.4	1054.0	26.9	14.9	1132.2
Sourou/Gassan	33.2	628.5	33.4	21.1	716.2
Tanghin-Dassouri	18.7	714.2	16.6	37.0	786.5
Tansilla	30.5	886.0	8.3	15.6	940.4
Tema	40.5	622.2	21.0	18.9	702.6
Tenkodogo	37.2	847.7	20.6	10.4	915.9
Thiou	0.0	545.2	33.0	17.0	595.2
Thyou	0.0	802.6	24.6	26.3	853.5
Tiebele	33.3	860.3	10.2	21.5	925.3
Tikare	38.2	669.5	24.4	11.4	743.5
Tiogo	47.7	624.3	17.8	21.2	711.0
Titao	34.4	488.0	0.0	19.8	542.2
Toma	43.2	694.4	8.3	10.7	756.6
Tougan	26.7	653.9	37.1	14.4	732.1
Tougouri	29.7	534.5	15.9	17.4	597.5
Wona	28.4	803.8	23.7	11.8	867.7
Yako	32.9	669.3	28.4	14.4	745.0
Zabre	11.9	915.6	17.2	12.0	956.7
Zorgo	20.5	747.0	14.4	9.2	791.1

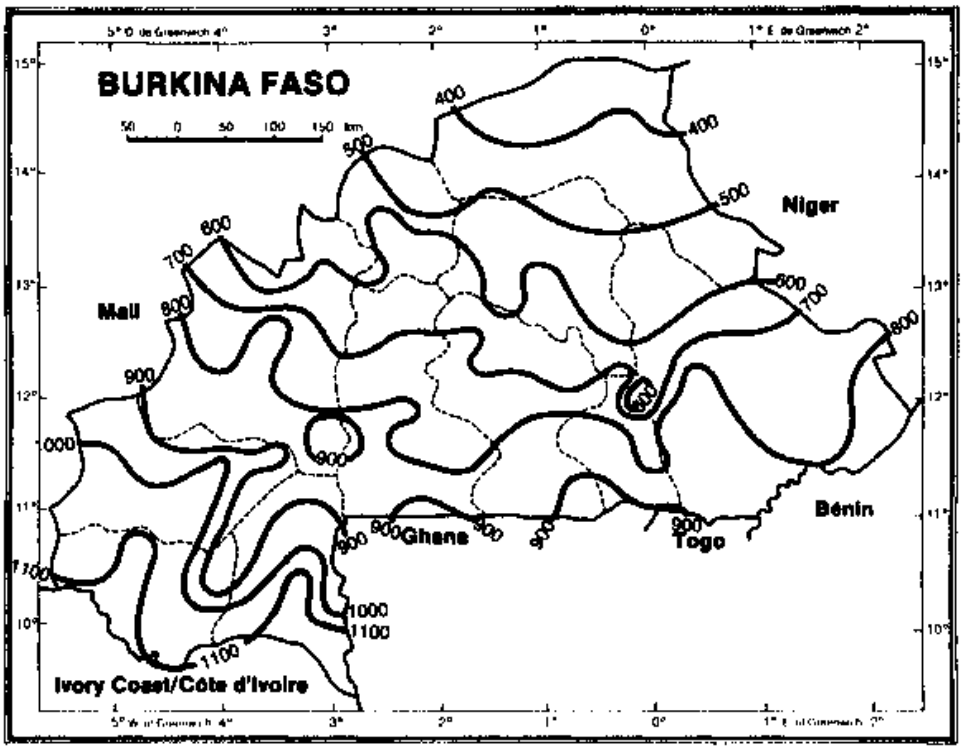


Figure 13. Mean rainfall (mm) during rainy season in Burkina Faso.

Figure 13. Pluviometrie moyenne (mm) au cours de la saison des pluies au Burkina Faso.

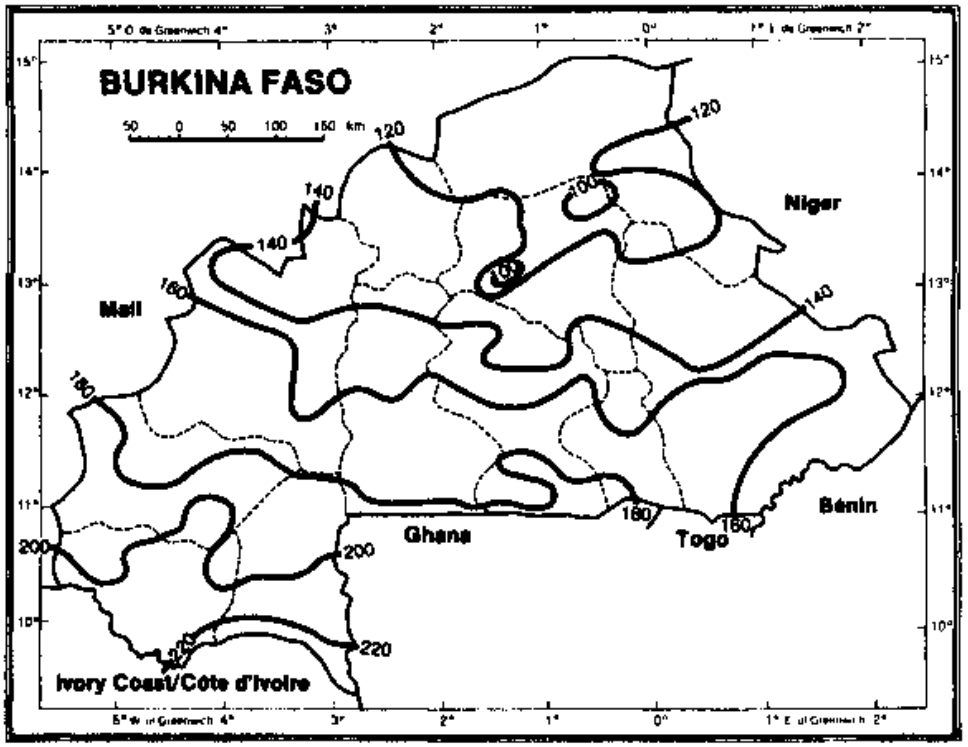


Figure 14. Length of the rainy season (days) in Burkina Faso.

Figure 14. Duree de la saison des pluies (jours) au Burkina Faso.

Monthly Rainfall

The mean monthly rainfall and annual rainfall along with the standard deviation, coefficient of variation (CV), maximum and minimum rainfall, and the range of rainfall recorded each month have been computed from the daily rainfall data for all the locations in Burkina Faso. The results of this analysis are presented in Appendix I.

The monthly rainfall patterns are different for each climatic zone of Burkina Faso. The maximum rainfall in the south and in the center is received in July, August, and September, and in the north in July and August. The decrease in the rainfall from south to north is quite steady in the eastern half of the country. But it changes in the western half, in particular in the central west, due to the presence of relatively high mountains and in regions more to the west due to Bobo-Dioulasso and Banfora plateaus and wooded valleys of Volta Noire.

Even at a given location, the monthly rainfall varies from year to year. As shown in Appendix I, the CV of monthly rainfall is very large during the dry and prehumid periods. During the rainy season the CVs are, as can be expected, lower with July and August recording the lowest CV. The large range of monthly rainfall even at locations such as Batie in the Southern Sudanian Zone provides evidence to the wide variability in rainfall that is a characteristic of the country.

The monthly rainfall distribution in Burkina Faso varies with the latitudinal position of the location due to the dominating influence of the ITCZ. The distribution of monthly rainfall is shown in Figure 15 for six locations–Batie, Gaoua, Po, Ouagadougou, Kaya, and Markoye–spread from 9° 53'N to 14° 38'N latitudes. At Batie, the rainfall is well distributed while in locations north of Po (11° 10'N), rainfall in August shows a pronounced peak. Markoye situated in the Sahelian Zone shows the influence of the northernmost movement of the ITCZ with low rainfall in all months with the exception of 134 mm in August.

Probability Estimates of Rainfall

Rainfall data, in the form of simple arithmetic averages, provide, a broad description for generalized application. The annual, seasonal, and monthly rainfall patterns in Burkina Faso described above present an average picture of water availability but averages tend to conceal the true phenomena of biological importance by masking interyear fluctuations. For example, the quantity of rainfall received over a period of time at a particular location gives a general indication of its sufficiency for crop needs.

Often the survival of a crop depends upon the reliability of receiving a specific amount of rainfall for a short interval. Knowledge of rainfall estimates in a given geographical region enables the development of suitable strategies for agricultural planning and implementation. In determining rainfall probabilities, fitting a mathe-

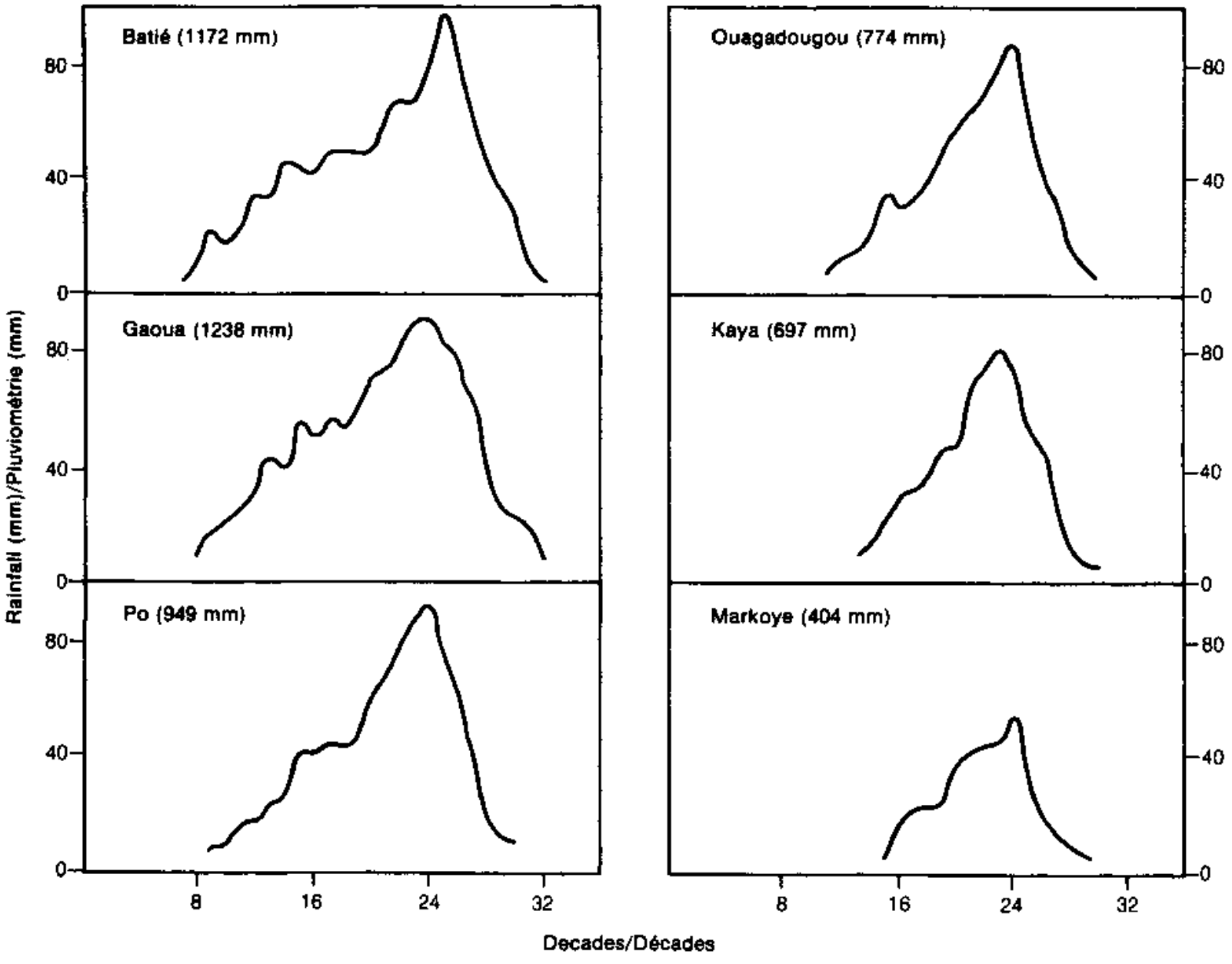


Figure 16. Decadal rainfall patterns for six locations in Burkina Faso.

Figure 16. Sur une base décadaire, régime des pluies pour six stations au Burkina Faso.

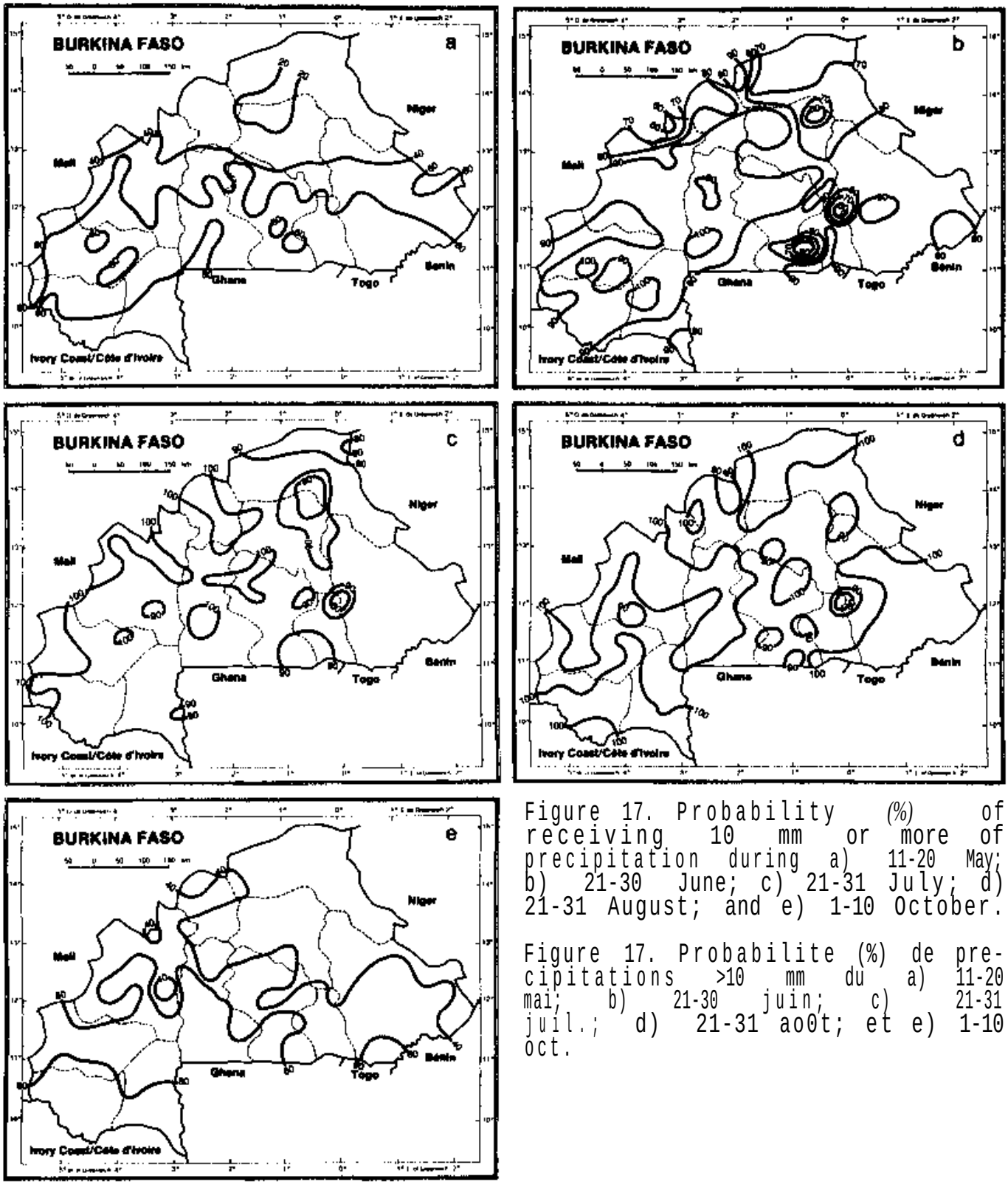


Figure 17. Probability (%) of receiving 10 mm or more of precipitation during a) 11-20 May; b) 21-30 June; c) 21-31 July; d) 21-31 August; and e) 1-10 October.

Figure 17. Probabilite (%) de precipitations >10 mm du a) 11-20 mai; b) 21-30 juin; c) 21-31 juil.; d) 21-31 ao0t; et e) 1-10 oct.

17a). By late June (decade 18) due to the northward shift in the position of the ITCZ, the probabilities in the Northern Sudanian Zone increase up to 90% and in the Sahelian Zone up to 60% (Fig. 17b). By late July (decade 21) with the peak rainfall activity associated with the favorable positioning of the ITCZ over Burkina Faso, the probabilities exceed the dependable level of 70% all over the country (Fig. 17c) and show essentially the same trend till the end of August as shown in Figure 17d (decade 24). By decade 28 (1-10 October) when the ITCZ starts receding and moves south of the equator, the rainfall probabilities decrease to 30% in the Sahelian Zone while in the Northern Sudanian Zone the probabilities range from 30% to 70% (Fig. 17e). In the Southern Sudanian Zone–including Batie, Kampti, and Niangoloko–the probabilities still exceed the dependable level of 70%. In this zone, the rains prolong up to the end of October.

Probability of 20 mm or more. As the threshold rainfall for the computation of probabilities is increased up to 20 mm, the rainfall probabilities decrease (Fig. 18) especially in the Sahelian Zone where the decadal rainfall is low as shown in Figure 16 for Markoye. Even in the peak rainy season (for example decade 21, 21-31 July) the probabilities in the Sahelian Zone are below 80% (Fig. 18c). In the Northern and Southern Sudanian Zones however, the probabilities in July and August exceed the dependable level of 70% as defined by Hargreaves (1975). By the beginning of October (decade 28) however, the probabilities in the Northern Sudanian Zone (e.g., Ouagadougou) range from 20% to 50% while in the Southern Sudanian Zone (e.g., Kampti, Niangoloko) the probabilities exceed 60% (Fig. 18e).

Probabilities of exceeding 30, 40, and 50 mm or more. The probabilities of receiving 30, 40, and 50 mm or more in the 5 selected decades are shown in Figures 19, 20, and 21. These data could be used to assess the dependability of rainfall during the growth stages of crops requiring more water or to identify the more-dependable areas in Burkina Faso and their potentials. At the higher threshold levels, the risk to cropping in the Sahelian Zone is immediately apparent from the patterns shown in Figures 19-21. During 11-20 May, in the Sahelian Zone as well as the Central Northern Sudanian Zone, the probabilities of receiving 30 mm rainfall are very low and even by end of June (decade 18), the probabilities range only from 20% to 60% in these areas. In the months of July and August (decades 21 and 24) when the crops are in the active-growth stages, the probabilities of receiving rainfall over 40 mm are less than 50-60% in the Sahelian Zone. Locations situated on the southern boundary of the Northern Sudanian Zone and in the Southern Sudanian Zone are dependable and show considerable promise. For example, at Niangoloko, Kampti, and Batie, the probabilities of receiving 40 mm of rainfall are higher in July and August compared to the Northern Sudanian and Sahelian Zones and decrease by early October.

Constant probability analysis

The expected quantity of rainfall and the degree of certainty with which this rainfall occurs are two of the most-important factors that are crucial in farm management decision-making. This is more relevant

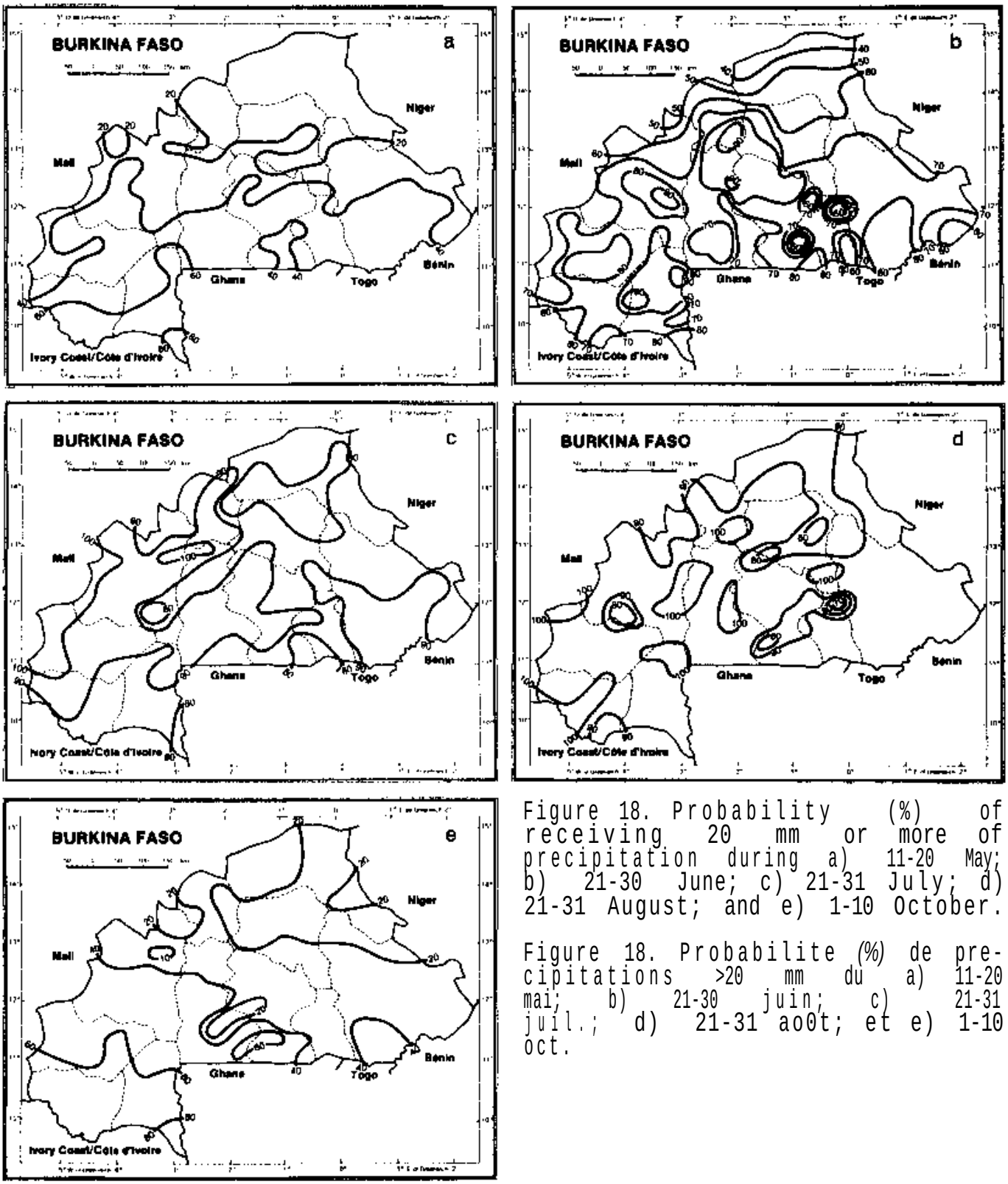
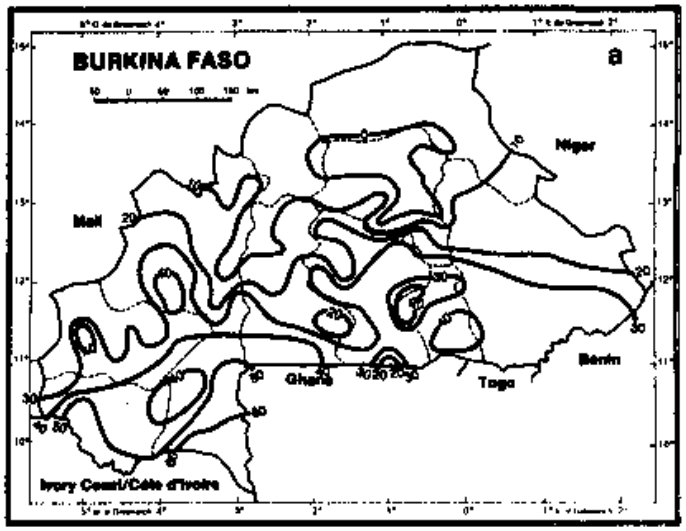
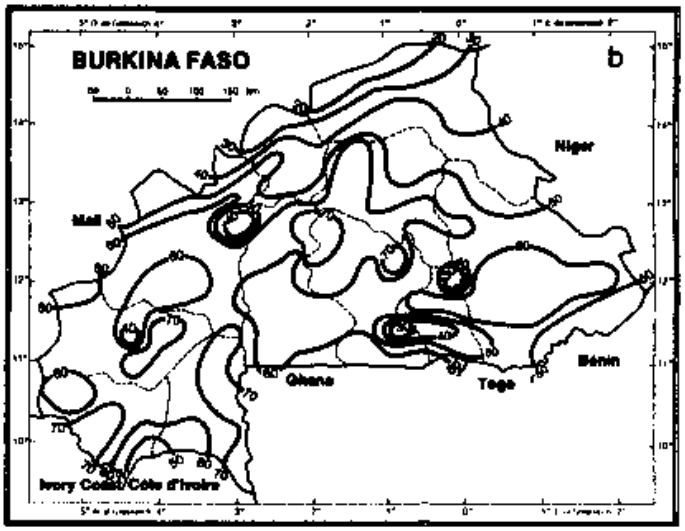
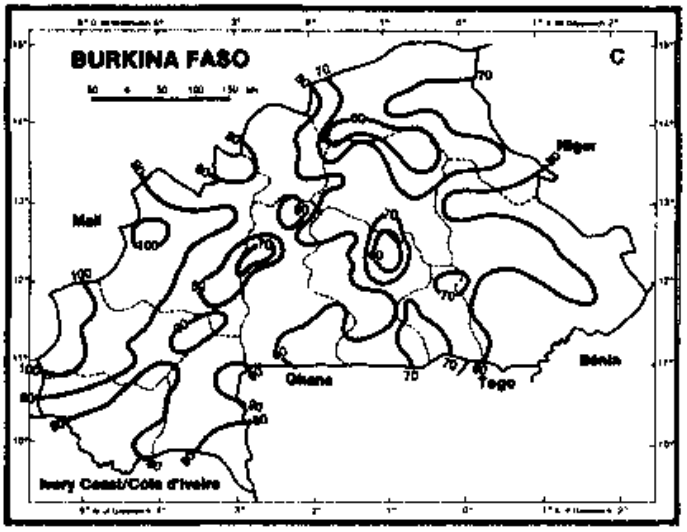


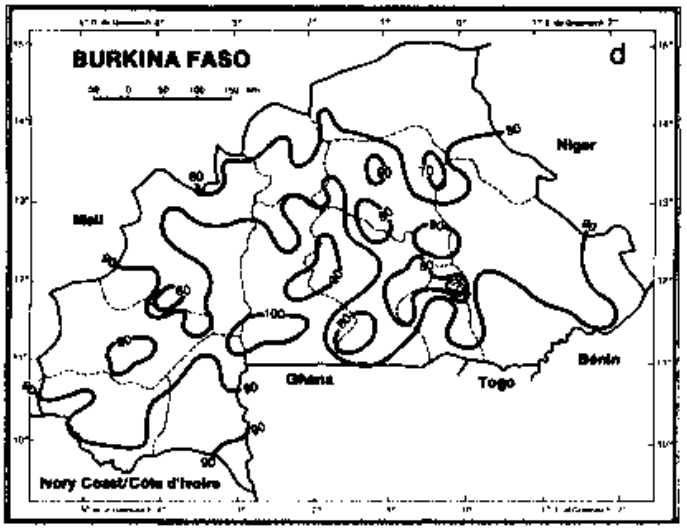
Figure 18. Probability (%) of receiving 20 mm or more of precipitation during a) 11-20 May; b) 21-30 June; c) 21-31 July; d) 21-31 August; and e) 1-10 October.

Figure 18. Probabilite (%) de precipitations >20 mm du a) 11-20 mai; b) 21-30 juin; c) 21-31 juil.; d) 21-31 ao0t; et e) 1-10 oct.









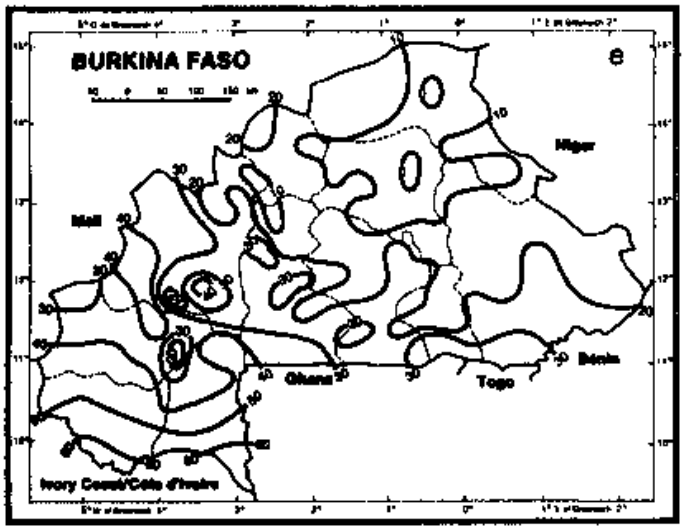


Figure 19. Probability (%) of receiving 30 mm or more of precipitation during a) 11-20 May; b) 21-30 June; c) 21-31 July; d) 21-31 August; and e) 1-10 October.

Figure 19. Probabilité (%) de précipitations >30 mm du a)11-20 mai; b)21-30 juin; c) 21-31 juil.; d) 21-31 août; et e) 1-10 oct.

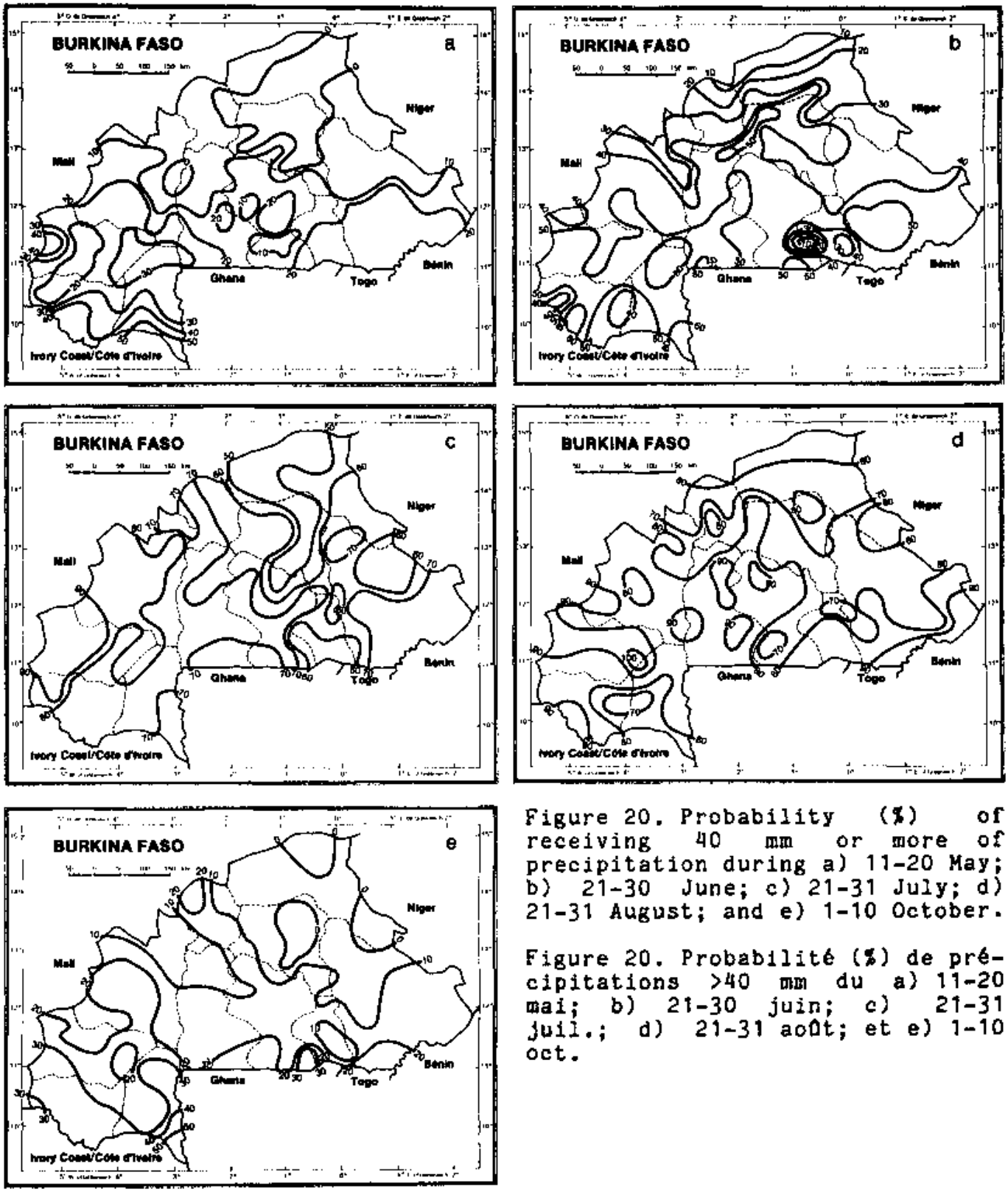


Figure 20. Probability (%) of receiving 40 mm or more of precipitation during a) 11-20 May; b) 21-30 June; c) 21-31 July; d) 21-31 August; and e) 1-10 October.

Figure 20. Probabilité (%) de précipitations >40 mm du a) 11-20 mai; b) 21-30 juin; c) 21-31 juil.; d) 21-31 août; et e) 1-10 oct.

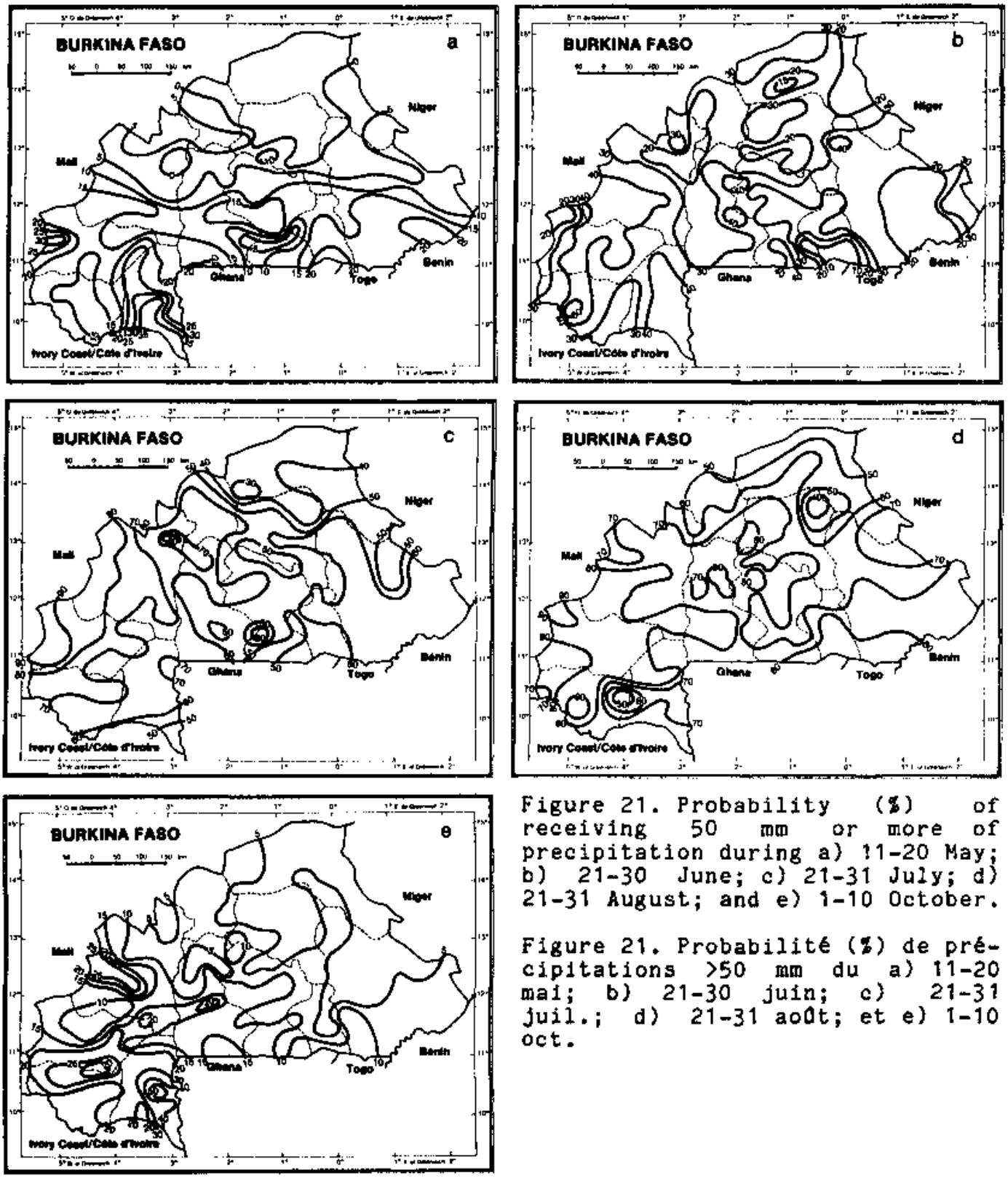


Figure 21. Probability (%) of receiving 50 mm or more of precipitation during a) 11-20 May; b) 21-30 June; c) 21-31 July; d) 21-31 August; and e) 1-10 October.

Figure 21. Probabilité (%) de précipitations >50 mm du a) 11-20 mai; b) 21-30 juin; c) 21-31 juil.; d) 21-31 août; et e) 1-10 oct.

in the context of the importance attached to the right time of sowing and the associated primary cultivation in the semi-arid tropics to ensure good crop establishment and subsequent performance. Hargreaves (1974) defined the dependable precipitation as the rainfall amount received at 70% probability. But the level of dependability of precipitation chosen at a particular phenological stage of a given crop depends on the demand for moisture at that stage. For highly sensitive crops or high-value crops, a higher level of probability may be more appropriate.

Expected precipitation amounts at different probability levels for each decade have been calculated using an incomplete gamma distribution. The computer program used for this analysis is listed in Appendix IV. Results of constant probability analysis are presented in Appendix V.

As in the case of the constant precipitation analysis, 4 of the 36 decades in the year have been selected for depicting the regional patterns of expected amount of rainfall at four specified probability levels, i.e., 25, 50, 75, and 90%. The four decades selected for this purpose were the same ones used earlier in the constant precipitation analysis, i.e., decades 14, 18, 21, and 28.

Decade 14. Expected quantities of rainfall at 25, 50, 75, and 90% probabilities during 11-20 May are plotted in Figure 22. As discussed earlier under the constant precipitation analysis, locations in the southern boundary of the Northern Sudanian Zone and on the Southern Sudanian Zone show good potential as even at 25% probability level the expected amount of rainfall exceeds 40 mm. North of the 13th parallel, the expected rainfall is below 20 mm. At the probability level of 50%, which reflects the mean patterns, the expected amounts decrease. But the highest amounts as in the case of the lower probability level of 25%, are still received on the eastern end of the Southern Sudanian Zone including Batie, Kampti, and Gaoua. As the probability levels increase to 75% and 90%, the expected amount of rainfall decreases all over the country with the Southern Sudanian Zone receiving at least a few mm of rainfall. At 90% probability in the Sahelian Zone, the expected rainfall is almost nil reflecting thereby the risk to crop establishment during this period.

Decade 18. The increased activity of ITCZ in all the regions of Burkina Faso with the attendant increase in rain is reflected in the expected amount of rainfall at all probability levels. At the lowest probability level of 25% (Fig. 23), the expected amount of rainfall increases from 40 mm in the Sahelian region to over 70 mm in the Southern Sudanian Zone around Gaoua and Niangoloko. In the Northern Sudanian Zone, the expected rainfall ranges between 40 mm and 70 mm with the highest amounts recorded on the western end. With the increased probability of 50%, the basic pattern remains similar to that at the 25% probability with expected amounts showing a 20-30 mm reduction at all locations. Rainfall received during this period is important for the early vegetative growth of the crops. The expected amount of rainfall at the 75% probability level shows some interesting patterns. At locations such as Ouagadougou and Dedougou in the Northern Sudanian Zone, the expected rainfall is similar to that at Gaoua

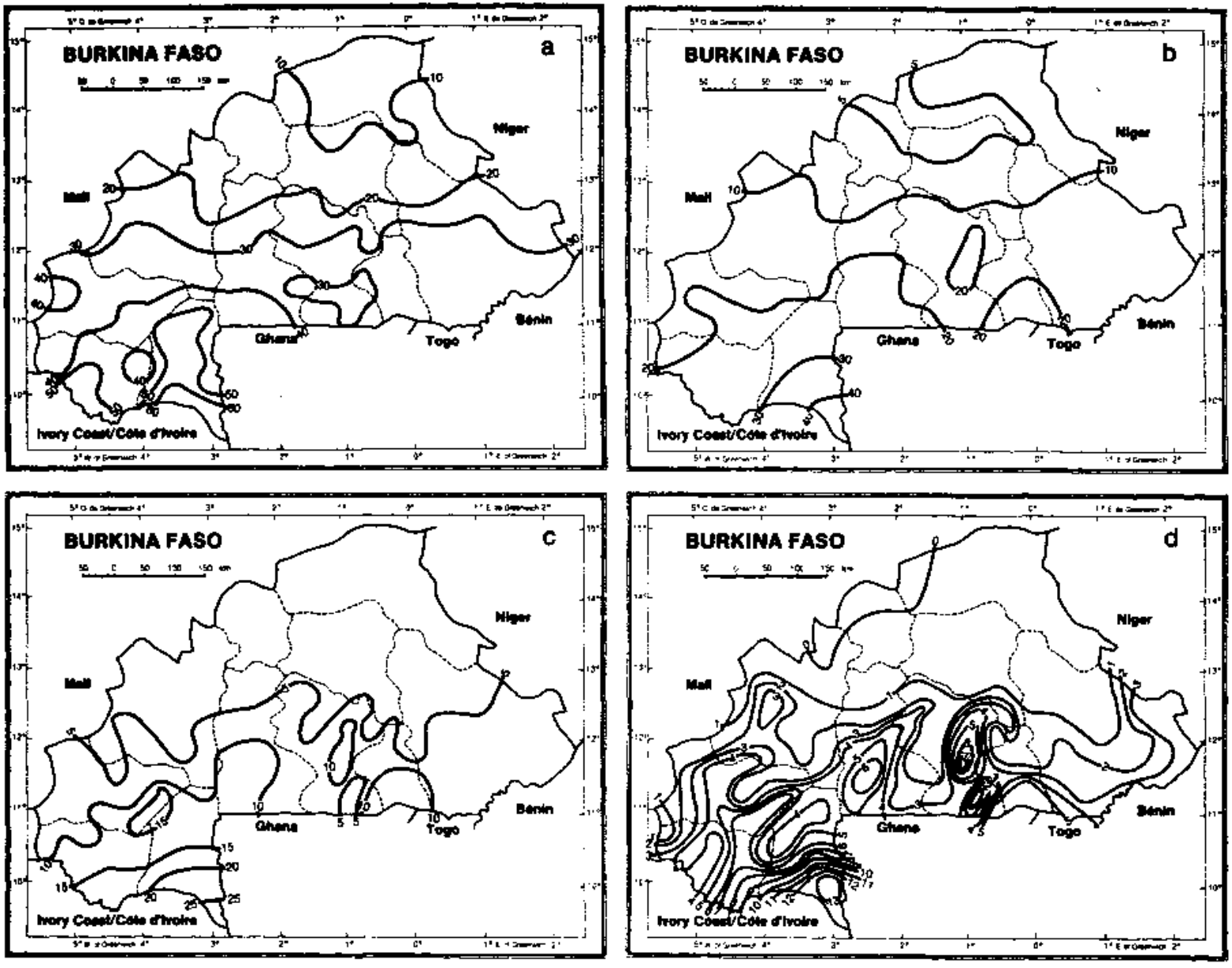


Figure 22. Precipitation (mm) that could be received during 11-20 May at a probability of a) 25%; b) 50%; c) 75%; and d) 90%.

Figure 22. Précipitations (mm) susceptibles d'être reçues du 11-20 mai à une probabilité de a) 25%; b) 50%; c) 75%; et d) 90%.

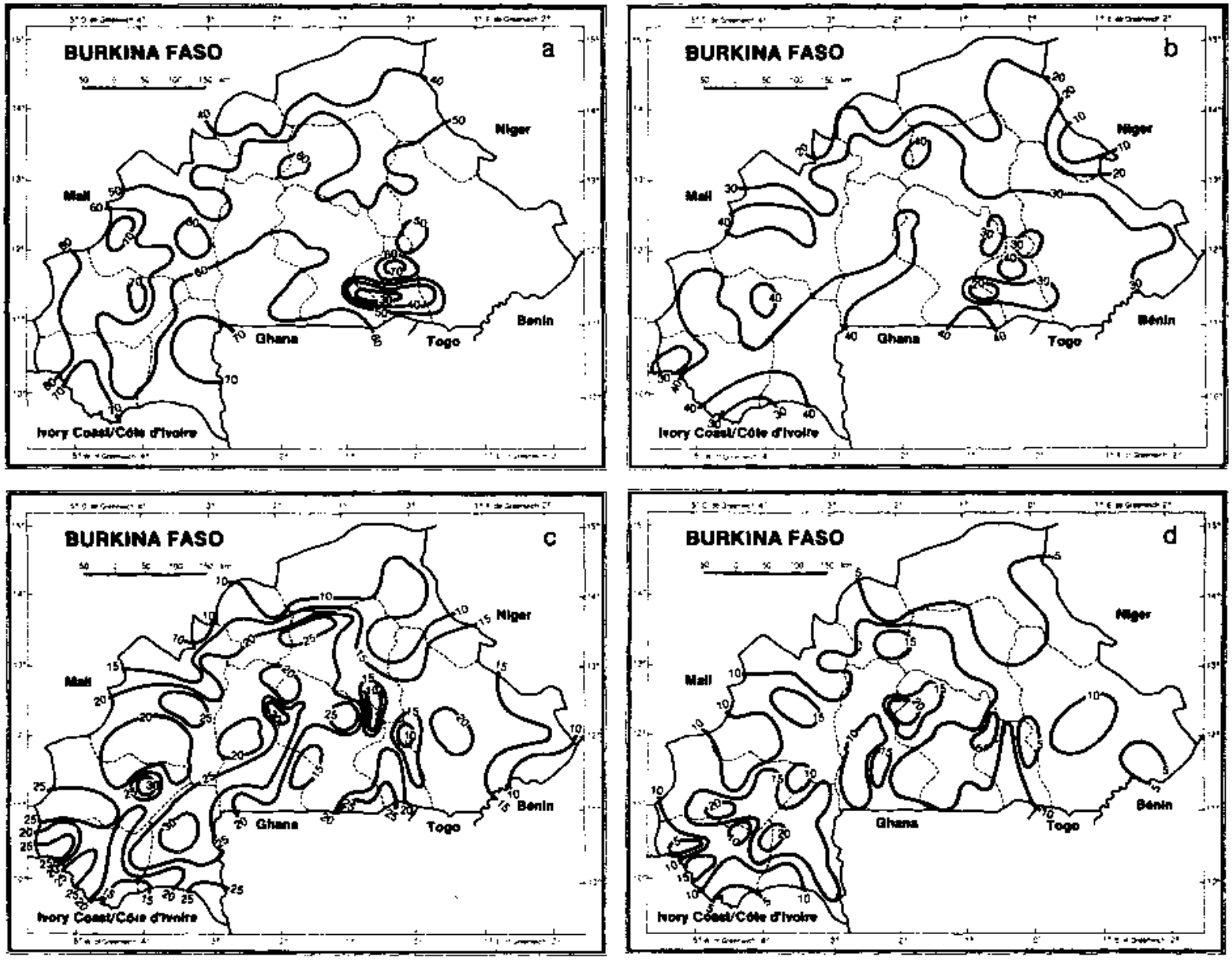


Figure 23. Precipitation (mm) that could be received during 21-30 June at a probability of a) 25%; b) 50%; c) 75%; and d) 90%.

Figure 23. Précipitations (mm) susceptibles d'être reçues du 21-30 juin à une probabilité de a) 25%; b) 50%; c) 75%; et d) 90%.

and Niangoloko in the Southern Sudanian Zone, indicating that at a more-dependable level during this period, there is a general reduction in the expected rainfall in the Southern Sudanian Zone as compared to the data given for decade 14. This conclusion is also corroborated by the decadal rainfall pattern shown earlier in Figure 16, where for Batie the decadal rainfall after increasing from mid-April to mid-June shows a reduction from decade 18 to decade 21. This pattern, however, is not seen at Ouagadougou. At 90% probability, the expected rainfall at Gaoua, Batie, and Niangoloko is less than that at Ouagadougou and Dedougou.

Decade 21. By this period when the ITCZ reaches its peak activity and brings rain to all regions in Burkina Faso, the expected rainfall at 25% probability (Fig. 24) is considerably higher. For example, both at Aribinda (14° 14'N), located in the Sahelian Zone, and at Batie (9° 53'N) the expected rainfall is 90 mm. In the western region of the Central Northern Sudanian Zone including Boromo, Bobo-Dioulasso, and Samo Ragouan the expected rainfall is higher compared to the eastern region. During this period, in general, expected rainfall exceeds the potential evapotranspiration demand (discussed later). At the median-probability level of 50% also, this conclusion seems valid. At the higher-probability levels of 75% and 90%, in the western end of the Northern Sudanian as well as the Southern Sudanian Zones, the expected rainfall is higher when compared to the eastern end. Comparison of expected rainfall at Banfora (4° 46'W) with Gaoua (3° 11'W), or Dedougou (3° 28'W) with Diapaga (1° 47'E) brings out the differences in these expected rainfall patterns.

Decade 28. By this decade, the rainfall in the Southern Sudanian Zone and in the southern end of the Northern Sudanian Zone is still higher. As shown in Figure 25, in this region the expected rainfall at 25% probability is in excess of 40 mm. In the Sahelian Zone, the expected rainfall is less than 20 mm reflecting the reduced activity of the ITCZ in this region. At the median-probability level of 50%, the expected amount of rainfall decreases by 20 mm in the Southern Sudanian Zone, and to less than 10 mm in the Sahelian Zone. At 90% probability, the expected rainfall in the Sahelian Zone is zero and crops could face the risk of water shortage if grain filling is likely to continue. In the Northern and Southern Sudanian Zones, this risk is likely to be less as can be seen from the expected rainfall.

Temperature

The temperature of the environment is mainly a manifestation of the radiation and energy balance. Because of uniformly high radiation levels throughout the year, Burkina Faso in general has a warm environment that is seasonally modified by changes in water regimes and surface conditions. Monthly average maximum and minimum air temperatures for 23 locations in Burkina Faso are given in Table 6.

For locations in the Southern Sudanian Zone, represented by Beregadougou, Bobo-Dioulasso, Diebougou, Farako-Ba, Gaoua, and Niangoloko, the annual variation in temperature is less marked when compared to the other two climatic zones. There are two cool seasons in this

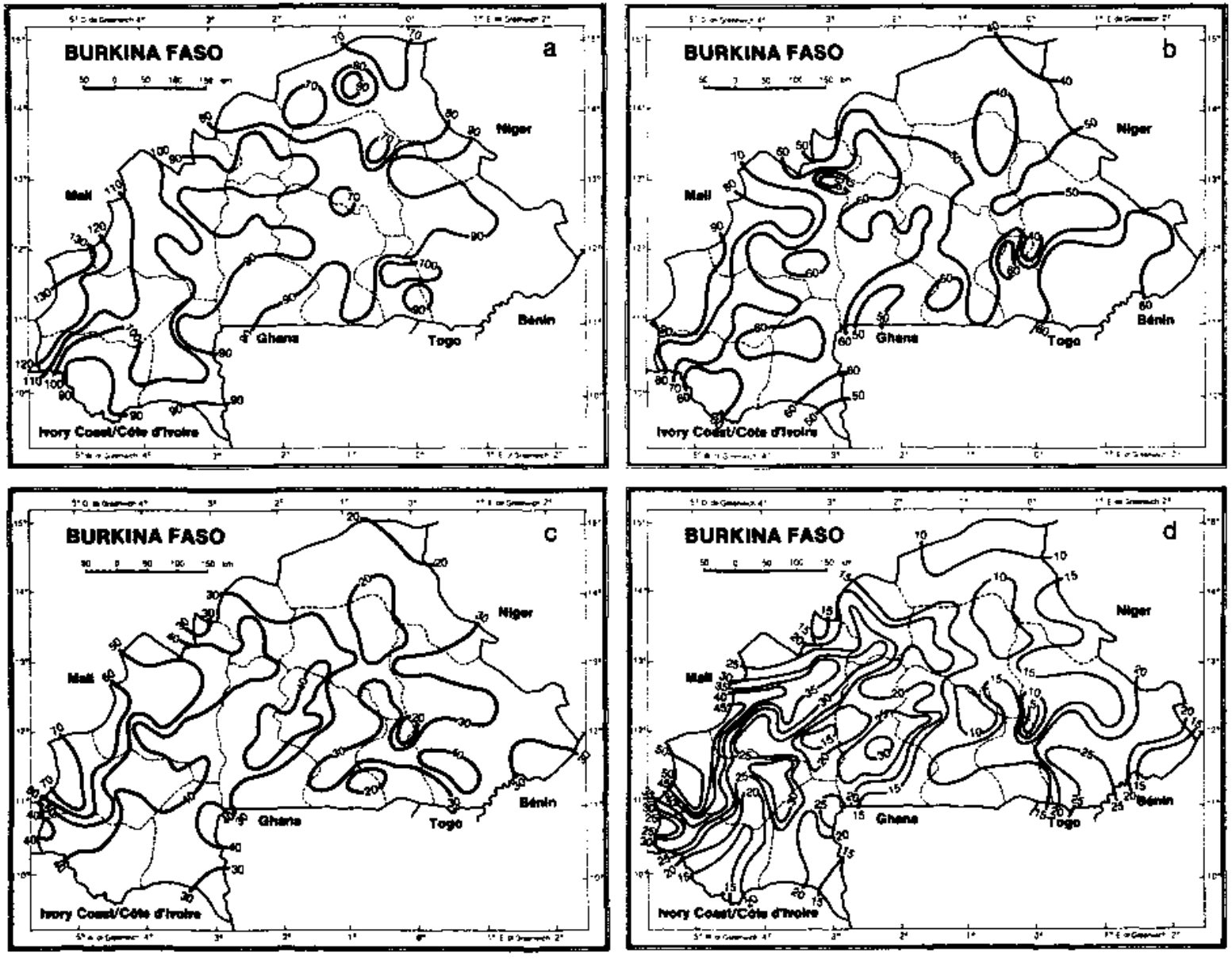


Figure 24. Precipitation (mm) that could be received during 21-31 July at a probability of a) 25%; b) 50%; c) 75%; and d) 90%.

Figure 24. Précipitations (mm) susceptibles d'être reçues du 21-31 juillet à une probabilité de a) 25%; b) 50%; c) 75%; et d) 90%.

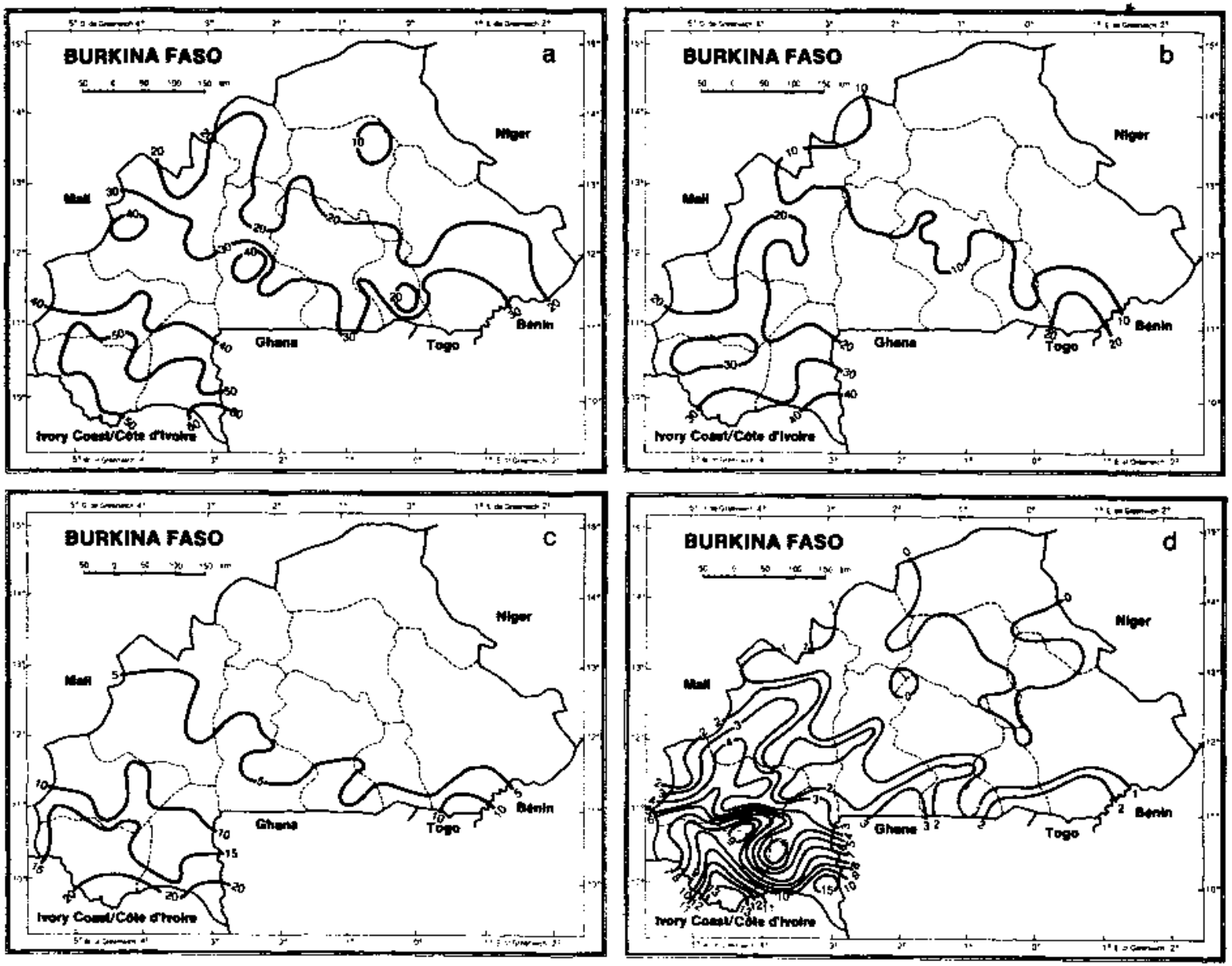


Figure 25. Precipitation (mm) that could be received during 1-10 October at a probability of a) 25%; b) 50%; c) 75%; and d) 90%.

Figure 25. Précipitations (mm) susceptibles d'être reçues du 1-10 octobre à une probabilité de a) 25%; b) 50%; c) 75%; et d) 90%.

zone, one from November to February when the minimum temperatures reach below 21°C under the influence of the trade winds and the harmattan, and a second in August when the cool monsoon winds predominate. During the dry season, the maximum temperatures vary between 33° and 37°C, and the minimum temperatures between 17° and 25°C. During the rainy season, the diurnal range in temperatures is reduced and varies from 8° to 13°C with the maximum temperatures between 29° and 34°C and the minimum temperatures around 21°C.

The diurnal and annual variations in temperature are more important in the Northern Sudanian Zone than in the Southern Sudanian Zone. During the dry season between December and May, the mean maximum temperatures vary between 34° and 41°C while the mean minimum temperatures range from 16° to 26°C with a wider diurnal range in temperature than is evident in the Southern Sudanian Zone. During the rainy season, the diurnal range in temperature decreases but is still larger than locations situated in the south. During this period the mean maximum temperatures are of the order of 30°-36°C while the mean minimum temperatures vary between 20° and 25°C.

In the Sahelian Zone, represented by Dori in Table 6, the diurnal and annual variations in temperature are more marked. Two hot seasons could be distinguished–the first from September to October and the second from March to June separated by a cool season from November to February. The diurnal variation in temperature is markedly higher (15°-20°C) during the dry season than that attained during the rainy season (8°-10°C). The mean maximum air temperatures are very high during the hot, dry season (March to May) reaching up to 42°C, while during the rainy season they vary between 32° and 35°C. The minimum air temperatures that are lower during the cool season (13°-18°C at Dori) compared to the other climatic zones, increase progressively to 27°C during May and vary between 23° and 25°C during the rainy season.

Statistical analysis of air temperatures

An assessment of the thermal regimes for Burkina Faso can be made by computing the probabilities of exceeding temperatures of given magnitude. Such analyses are useful to evaluate the rates of activity of temperature-dependant processes such as leaf initiation, leaf expansion, photosynthesis, and respiration. The C4 crop species are far more sensitive to low temperatures than to high temperatures, provided there is sufficient moisture supply. In contrast, the optimum temperature for carbon dioxide assimilation for C3 species is in the broad range of 10-25°C and the assimilation decreases as the temperature increases above 25°C (Black 1971).

Using available long-term monthly maximum and minimum temperature data for seven locations in Burkina Faso, mean temperature, standard deviation, coefficient of variation, and the probabilities of exceeding five designated temperature levels have been computed. The results are presented in Appendix VI for maximum temperatures and Appendix VII for minimum temperatures.

Table 6. Monthly average maximum and minimum air temperature (°C) for selected stations in Burkina Paso.

Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Benan-keledaga	34.6[1]	37.2	38.4	38.2	36.9	34.1	31.5	30.8	32.0	34.5	35.7	34.6
	12.9	15.8	20.5	23.6	23.8	21.8	21.0	21.0	20.8	20.6	16.5	13.6
Berega-dougou	34.4	36.1	37.2	36.3	34.0	31.5	29.7	29.3	30.4	32.7	34.2	33.6
	17.4	20.0	22.5	23.8	23.3	22.0	21.4	21.4	21.1	21.1	18.5	17.6
Bobo-Dioulasso	33.2	35.4	36.9	36.5	34.6	32.0	30.1	29.1	30.4	33.1	34.2	33.2
	17.4	19.4	22.3	23.7	23.0	21.6	20.9	20.8	20.6	21.1	19.8	17.3
Boromo	34.6	37.1	38.8	38.8	36.8	33.9	31.4	30.4	31.6	35.0	36.1	34.5
	16.3	19.1	22.7	25.2	24.8	23.0	22.0	21.7	21.5	21.6	18.5	16.5
Dedougou	33.8	36.3	38.4	39.3	37.6	34.5	31.7	30.6	32.0	36.3	36.3	33.7
	18.5	20.4	24.0	26.2	25.6	23.7	22.3	21.9	21.9	22.1	20.5	18.5
Diapaga	33.8	36.8	38.9	39.5	36.6	34.0	31.2	30.1	31.7	35.4	36.0	33.9
	15.4	18.0	22.5	25.1	24.9	25.7	22.3	21.9	21.8	21.8	17.7	15.9
Diebougou	34.0	36.4	37.4	36.7	35.3	32.5	30.5	29.8	30.9	33.7	35.4	34.4
	18.7	20.9	23.2	24.4	24.1	22.3	21.9	21.3	21.3	21.4	18.9	18.3
Dori	33.0	36.0	39.3	41.5	41.0	38.4	34.5	32.9	34.6	38.4	37.1	34.0
	13.8	15.9	20.2	24.1	26.6	25.3	23.5	22.6	22.9	22.7	18.1	14.8
Fada N'Gourma	34.5	36.9	39.5	39.8	37.6	34.7	32.1	30.7	32.1	35.7	36.6	34.9
	16.6	19.1	23.0	25.5	24.9	23.2	22.0	21.5	21.3	21.3	18.0	16.6
Farako-Ba	33.2	35.3	36.4	35.8	34.2	31.4	29.5	29.2	30.2	32.4	33.6	33.0
	15.3	17.3	21.4	23.4	23.5	21.7	21.1	20.9	20.6	20.6	16.7	14.4
Gaoua	34.5	36.6	37.3	36.3	34.2	31.9	30.1	29.5	30.7	33.3	35.1	34.3
	18.7	21.4	23.8	24.2	23.3	22.0	21.4	21.2	21.0	21.5	20.4	18.7
Kaya	31.8	35.1	37.8	39.1	38.1	35.3	32.3	31.0	32.2	36.2	35.1	32.4
	16.9	19.6	22.9	25.4	24.9	22.8	22.0	21.4	21.9	23.2	20.3	17.5
Kou-dougou	34.3	37.1	39.4	39.9	38.4	35.3	32.6	31.6	32.8	36.0	36.5	34.4
	16.4	18.1	22.2	24.5	24.5	22.8	21.9	21.3	21.5	21.7	18.6	15.9
Leo	34.6	36.8	37.5	37.5	35.3	32.4	30.3	29.8	31.1	33.4	35.4	34.1
	18.4	20.7	23.5	24.7	24.0	22.3	21.6	21.2	21.0	21.3	18.9	17.6

1. Figures in the top row for each station indicate the maximum air temperature and those in the bottom row the minimum temperature.

.. contd.

Table 6 continued.

Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Markoye	31.7[1]	34.8	38.2	40.9	41.1	39.0	35.8	34.3	36.5	38.8	35.8	32.2
	14.2	16.1	20.9	24.7	27.3	26.5	24.7	23.6	23.8	22.6	18.2	14.9
Mogtedo	32.6	35.5	37.8	38.7	37.1	34.4	32.0	30.6	32.2	35.1	34.8	32.6
	15.9	18.1	21.9	24.1	25.3	23.7	22.7	21.7	21.6	20.9	16.9	15.2
Niango-loko	33.9	35.9	36.2	35.6	33.8	31.4	29.8	29.5	30.4	32.4	33.9	33.4
	18.8	21.3	22.9	23.6	22.9	21.6	21.1	21.0	21.0	21.2	19.8	18.3
Ouaga-dougou ville	34.0	36.5	38.6	39.2	37.2	34.1	31.7	30.9	32.2	35.5	36.0	33.9
	15.7	18.0	22.4	25.4	25.9	24.1	22.8	22.3	22.5	23.1	18.6	15.9
Ouaga-dougou aero	34.0	36.5	38.5	38.9	37.0	33.9	31.7	30.6	31.9	35.5	36.0	33.9
	16.4	19.1	23.3	25.8	25.3	23.5	22.4	21.8	21.8	22.5	19.5	16.9
Ouahi-gouya	33.3	36.2	38.8	40.3	39.5	36.8	33.4	31.8	33.2	37.0	36.4	33.6
	16.1	18.2	22.1	25.3	26.6	24.7	23.0	22.5	22.5	22.8	19.4	16.5
Saria	33.3	35.8	37.9	38.4	36.4	33.7	31.1	30.3	31.7	35.1	35.4	33.2
	15.9	18.1	22.5	25.0	25.6	23.7	22.5	21.8	21.7	21.6	17.4	15.2
Tenko-dogo	34.3	35.6	39.0	39.5	36.9	34.3	31.8	30.7	31.9	34.8	35.9	34.3
	19.9	22.4	24.7	26.0	24.8	23.3	22.1	21.7	21.8	22.7	21.5	19.8
Tougan	33.3	36.0	38.4	39.8	38.7	35.9	32.7	31.4	32.7	36.9	36.1	33.3
	19.0	21.1	24.4	26.7	26.2	24.5	22.7	22.2	22.1	23.3	21.7	19.1

1. Figures in the top row for each station indicate the maximum air temperature and those in the bottom row the minimum temperature.

Maximum air temperatures. The results (presented in Appendix VI) for different locations show that, in general, the maximum air temperature at a given place during the year varies relatively little, the coefficient of variation for monthly temperature being less than 5% in almost all cases while the annual means show a CV of 1-3%. The probabilities computed for exceeding 25°, 30°, 35°, 40°, and 45°C during the year show that, in general, the probabilities of exceeding 25°C and 30°C for any month during the year are almost 100% in all the locations.

At Bobo-Dioulasso and Gaoua, located in the Southern Sudanian Zone, the probability of exceeding 30°C during the rainy month of August are only 9% and 16%, respectively. For locations in the Northern Sudanian Zone such as Boromo, Fada N'Gourma, and Ouagadougou the probability of exceeding 30°C is over 50%. In the Sahelian Zone,

these probabilities are almost 100% as shown by Dori and Ouahigouya. During the rainy months from June to September in the Southern Sudanian Zone, the maximum air temperatures do not reach 35°C as shown by the probabilities for 35°C and above. In the Northern Sudanian Zone, this holds good only for the months of July-September for locations in the western end (Boromo) and in the center (Ouagadougou), while on the eastern side (Fada N'Gourma), even during the rainy months, maximum temperatures can exceed 35°C. In the Sahelian Zone (Dori) these probabilities are higher. In the Southern Sudanian Zone, the maximum air temperatures during the dry season rarely exceed 40°C, while in the Sahelian Zone the probability of exceeding 40°C are higher, especially during April and May. The data presented here show that in the Sahelian Zone, during the rainy season, crops undergo temperature stress in addition to water shortage, explaining thereby the preference for cultivation of drought-resistant crops such as millet.

Minimum air temperatures. The monthly CV for minimum air temperature is, in general, slightly higher compared to the maximum air temperature as shown in Appendix VII. For example, at Bobo-Dioulasso the CV for minimum air temperatures varies from 3% to 15% during the year. The probabilities for exceeding minimum air temperatures of 10°, 15°, 20°, 25°, and 30°C have been computed for all months during the year. In all the three climatic zones the probabilities of exceeding 10° C are 100% while for 15°C between November and February are lower in the Sahelian Zone (Dori) when compared to the Northern Sudanian Zone (Ouagadougou and Fada N'Gourma) and the Southern Sudanian Zone (Bobo-Dioulasso and Gaoua). At the higher threshold level of 20°C and above, during November-February, the probabilities are zero in the Sahelian Zone while in the Southern Sudanian Zone they are lower in November-December but higher in February.

The trend reverses during the hot season (March-May) and the beginning of the rainy season (June). In the Sahelian Zone, during this period, minimum air temperatures can exceed 25°C. At Boromo, Ouagadougou, and Fada N'Gourma, the probabilities of exceeding 25°C are higher only in April and May. In the Southern Sudanian Zone, there is a very low probability of exceeding 25°C only in the month of April and zero probability in other months.

Potential Evapotranspiration

The water requirement of a crop at two locations could be different although the rainfall amount and its distribution could be similar if the atmospheric demand for water between two locations is different. Potential evapotranspiration (PE) indicates the potential demand for water at a given location. PE is defined as the amount of water transpired from an active growing, short, green plant cover (usually grass) with a full cover and a continuously adequate moisture supply (Penman 1948). Monthly PE rates for eight stations in Burkina Faso were computed from maximum and minimum air temperatures, vapor pressure deficit, sunshine hours, and wind speed. The method of computation was similar to that described by Cocheme and Franquin (1967). The

computed values of average monthly PE for eight stations are shown in Table 7.

During the cooler months of November-February, the PE values in the Sahelian Zone (Dori and Ouahigouya) are lower than those in the Northern and Southern Sudanian Zones. With increasing air temperatures and solar radiation during the rainy season, the monthly PE rates in the Sahelian Zone rise faster and are the highest in the country. In the Southern Sudanian Zone, the PE rates during June-October are the lowest in the country. For example, at Bobo-Dioulasso and Gaoua, the PE during August is around 130 mm while at Dori in the Sahelian Zone it is 162 mm.

Table 7. Monthly mean Penman potential evapotranspiration (PE) estimates (mm) for nine stations in Burkina Faso.

Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Bobo-Dioulasso	163	170	201	197	186	161	143	130	135	156	149	146	1938
Boromo	123	128	175	183	182	161	143	134	139	150	126	115	1749
Dori	119	126	171	181	206	198	176	162	161	158	124	111	1914
Fada N'Gourma	143	150	190	197	201	176	153	139	140	156	138	133	1947
Farako-Ba	140	145	176	176	166	151	135	126	132	142	126	125	1742
Gaoua	134	145	182	176	167	147	130	125	131	146	136	127	1745
Ouaga-dougou	140	148	193	199	208	181	159	144	148	165	144	134	1983
Ouahigouya	125	131	171	182	198	185	164	155	155	164	127	116	1832

Climatic Classification

In the analysis discussed so far, no attempt has been made to classify the stations in Burkina Faso into homogenous groups. Such a classification would enable the transfer of technology using the climatic analog approach. The underlying hypothesis of this approach is that locations with similar climatic attributes would offer similar opportunities for exploitation of these natural resources. The often-used climatic attributes for this purpose are rainfall and PE as these two represent the supply and demand sides of the water balance. Many different classification systems are available that employ these attributes for the purpose of classification. The procedures outlined by Troll (1965) and Cocheme and Franquin (1967) are used here.

The basis for Troll's classification is the definition of a humid month, which has a mean rainfall that exceeds the mean PE for that

month. On the basis of the number of humid months in a year, Troll defined the thorn savannah belt or dry tropics as those with 2-4.5 humid months while the dry savannah or the wet-dry tropics as the region with 4.5-7 humid months. In the semidesert belt or arid regions, the number of humid months range from 1 to 2. Using the monthly rainfall and PE data for Burkina Faso (Virmani et al. 1980), we mapped the number of humid months. As shown in Figure 26, regions south of Ouahigouya, Bam, Dakiri, Tougan, and Sebba can be classified as dry tropics. North of these locations where the humid months range from 1 to 2, is the semidesert belt.

The second classification procedure used here is that of Cocheme and Franquin (1967), where the dates of the beginning and end of three distinct periods termed preparatory, humid, and moist are delineated using the dates at which the average rainfall equals 0.1, 0.5, and all of PE, respectively. The point where the rainfall equals 0.1 of PE defines the beginning of the preparatory period, which ends with the beginning of the first intermediate period, (P = 0.5 PE). The intermediate periods during which rainfall is more than half the PE but does not exceed it, occur before and after the humid period. The moist period is the sum of the humid and the two intermediate periods taken together.

The approximate dates of the start of the preparatory, moist, and humid periods and their durations for different locations in Burkina Faso are shown in Table 8. The preparatory period can be mainly used for soil preparation (Cocheme and Franquin 1967). The preparatory period starts early by 12 February at Batie and by 22 February at Kampti. In the Central North Sudanian Zone around Boromo, it starts a month later, i.e, by 28 March. The date of beginning of the preparatory period gets progressively delayed as one moves north. Around Dori and Aribinda in the Sahelian Zone the preparatory period starts in the beginning of June. The duration of the preparatory period ranges from 40 to 80 days across different locations permitting thereby land preparation ahead of the optimal date of sowing as indicated by the onset of the humid period.

The earliest onset of the moist period is again in the Southern Sudanian Zone where it occurs between mid- to late-April. The total duration of the moist period in this area is 170-200 days, which permits cultivation of long-duration sorghum and associated cropping systems and cotton. In the Central North Sudanian Zone, the duration of the moist period varies from 130 to 150 days and the beginning of the moist period is around mid- to late-May. In the Sahelian Zone, the moist period starts late June and is short (80-110 days) permitting thereby cultivation of only a short-duration millet crop.

During the humid period, rainfall exceeds the potential evapotranspiration, which indicates that crop water requirements can be adequately met during this period. The longer the duration of this period, the more stable is the success of a given cropping system. As shown in Table 8, the length of the humid period ranges from 20 days at Gorom to 128 days at Niangoloko. As with the preparatory and moist periods, the Southern Sudanian Zone is the most favorable of the climatic zones in Burkina Faso.

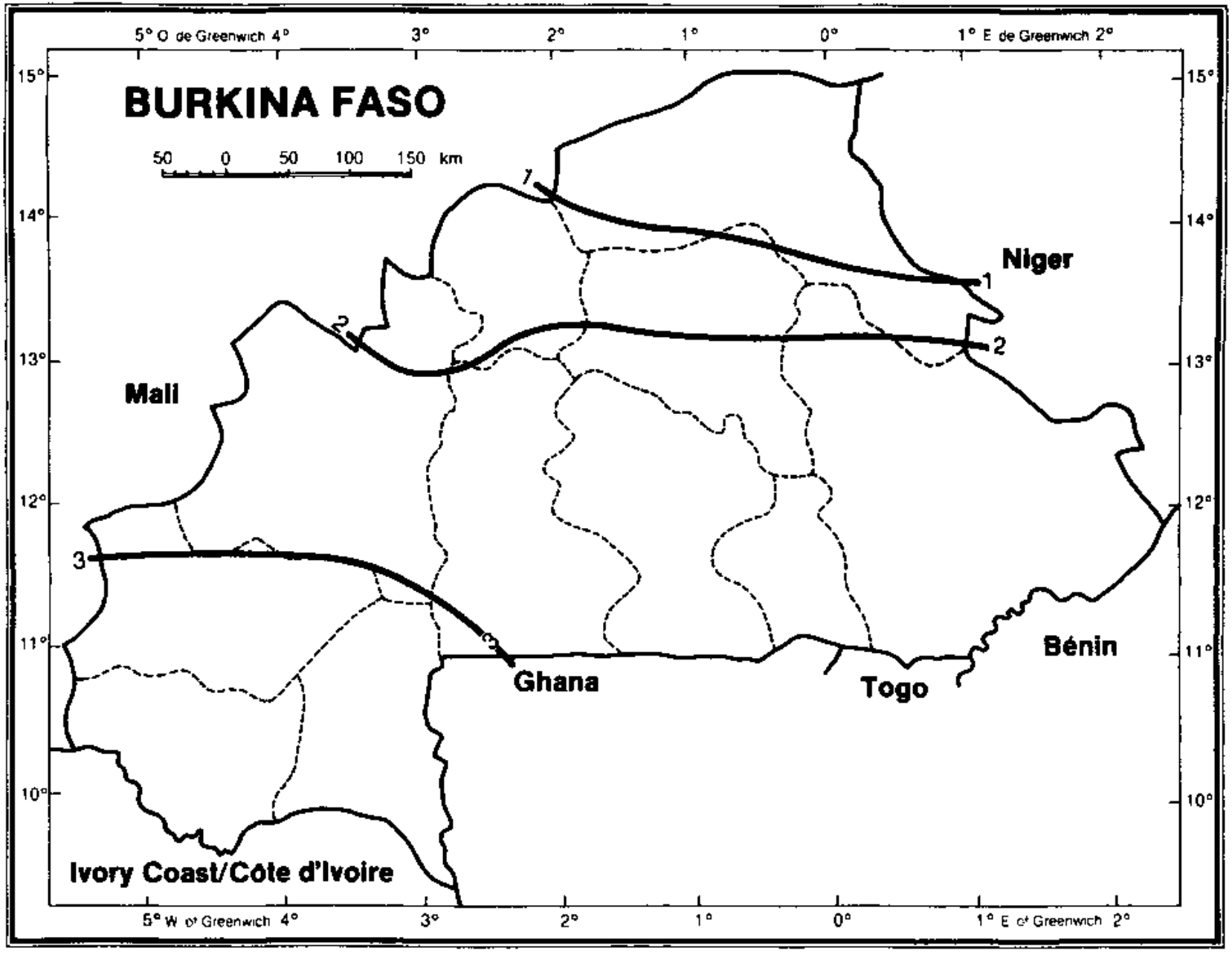


Figure 26. Number of humid months (as per Troll's approach) in Burkina Faso.

Figure 26. Nombre de mois humides (d'après la méthode de Troll) au Burkina Faso.

Table 8. Dates of beginning and durations of preparatory, humid, and moist periods for indicated locations in Burkina Faso.

Station	Annual rainfall (mm)	Dates of beginning			Number of days		
		Prepar. period	Humid period	Moist period	Prepar. period	Humid period	Moist period
Aribinda	484	6 May	26 Jul	27 Jun	52	34	84
Bam	649	27 Apr	16 Jul	12 Jun	46	58	111
Banankél-édaga	1068	8 Mar	12 Jun	5 May	58	112	162
Banfora	1159	13 Mar	9 Jun	27 Apr	45	117	175
Bani	577	2 May	21 Jul	22 Jun	51	49	99
Batié	1172	12 Feb	17 Jun	18 Apr	65	117	197
Bobo-Dioulasso	1076	14 Mar	17 Jun	3 May	50	109	168
Bogandé	647	17 Apr	11 Jul	16 Jun	60	67	108
Boromo	956	28 Mar	22 Jun	14 May	47	99	151
Boulsa	747	18 Apr	5 Jul	6 Jun	49	79	122
Dano	990	21 Mar	16 Jun	1 May	40	105	166
Dedougou	935	2 Apr	23 Jun	27 May	55	96	138
Diapaga	855	4 Apr	7 Jul	27 May	53	78	132
Diébougou	1044	17 Mar	7 Jun	2 May	46	118	167
Dionkélé	1032	26 Mar	20 Jun	12 May	47	102	155
Djibo	528	10 May	25 Jul	28 Jun	49	45	94
Dori	506	9 May	26 Jul	27 Jun	49	40	90
Fada N'Gourma	865	5 Apr	29 Jun	26 May	51	87	134
Farako-Ba	1081	7 Mar	12 Jun	5 May	59	112	162
Gaoua	1238	26 Feb	6 Jun	20 Apr	53	123	188
Garango	895	26 Mar	1 Jul	20 May	55	89	143
Gorgadji	474	7 May	2 Aug	18 Jun	42	26	96
Gorom	461	19 May	6 Aug	1 Jul	43	20	79
Gourcy	687	19 Apr	7 Jul	11 Jun	53	70	115
Guilongou	769	14 Apr	3 Jul	4 Jun	51	81	124
Kamboinsé	826	16 Apr	28 Jun	29 May	43	88	132
Kampti	1127	22 Feb	5 Jun	13 Apr	50	125	196
Kaya	697	24 Apr	9 Jul	8 Jun	45	70	117
Kombissiri	838	1 Apr	29 Jun	22 May	51	86	138
Koudougou	836	7 Apr	29 Jun	29 May	52	90	135
Koupéla	831	7 Apr	5 Jul	29 May	52	80	131
Lantaogo	655	26 Mar	29 Jun	28 May	63	86	131

.. contd.

Table 8 continued.

Station	Annual rainfall (mm)	Dates of beginning			Number of days		
		Prepar. period	Humid period	Moist period	Prepar. period	Humid period	Moist period
Léo	971	17 Mar	23 Jun	8 May	52	99	157
Manga	900	8 Feb	19 Jun	7 Apr	58	111	206
Markoye	404	22 May	9 Aug	10 Jul	49	15	68
Nasso	1098	8 Mar	11 Jun	6 May	59	115	162
Niangoloko	1266	17 Feb	1 Jun	17 Apr	59	128	186
Nouna	821	17 Apr	29 Jun	30 May	43	83	131
Orodara	1161	6 Mar	19 Jun	10 May	65	108	164
Ouagadougou	774	11 Apr	2 Jul	30 May	49	79	128
Ouahigouya	689	27 Apr	8 Jul	12 Jun	46	68	112
Ouargaye	854	18 Mar	7 Jul	6 Jun	80	82	124
Pabré	806	3 Apr	1 Jul	1 Jun	58	84	129
Pama	974	20 Mar	28 Jun	17 May	58	95	148
Po	949	20 Mar	23 Jun	17 May	58	98	147
Saba	831	12 Apr	26 Jun	29 May	47	87	131
Sapone	844	30 Mar	23 Jun	24 May	55	92	137
Sébba	628	24 Apr	6 Jul	15 Jun	52	70	109
Séguénéga	670	21 Apr	3 Jul	4 Jun	44	73	120
Sidéradougou	1072	5 Mar	17 Jun	1 May	56	109	171
Tenkodogo	923	25 Mar	1 Jul	18 May	54	90	145
Tougan	744	20 Apr	6 Jul	11 Jun	52	76	118
Tougouri	598	26 Apr	11 Jul	13 Jun	48	64	109
Yako	746	19 Apr	4 Jul	7 Jun	49	78	120
Zabré	957	18 Mar	1 Jul	12 May	55	90	154
Zorgho	791	3 Apr	1 Jul	30 May	57	86	131

The procedure used here suggests the potential for cropping and the associated risks but this does not take into account the type of the soil and the role of the soil-storage capacity in meeting crop water requirements. Hence, the data in Table 8 should be considered as providing only an approximate idea. The application of a water-balance procedure where the water-holding capacity of the soil is taken into account is described below.

Water Balance

So far the discussion was confined to the variability in the amount of rainfall and the PE at different locations in Burkina Faso, which undoubtedly affect the duration and the characteristics of the growing season. Differences in soils, especially with regard to the storage

capacity and availability of soil moisture, strongly influence agricultural potentialities. The balance between the available soil water, within the root zone of the soil, caused by rainfall, and the water loss resulting from evapotranspiration is of fundamental significance to plant growth in the semi-arid tropics.

A water-balance model (Keig and McAlpine 1974) was used to estimate the decadal available soil moisture storage for the eight locations in Burkina Faso for which the PE data were available. Use of the water-balance model is based upon two assumptions. The first assumption is that a maximum moisture-storage capacity of the soil is known or at least assumed. The second is that runoff or deep-drainage losses of rainfall occur only after the maximum water-storage capacity of the soil has been reached. Water storage of the soil at the end of the current decade was calculated by subtracting water loss of the soil due to evapotranspiration during the current decade from the sum of the water storage of the soil at the end of the previous decade and the amount of rainfall received during the current decade.

Using the above procedure, decadal available soil moisture was estimated for eight locations in Burkina Faso at two assumed water-storage capacities, i.e., 100 mm and 200 mm. These assumptions have been made to account for the variability of the soils in each region. Results of water-balance analysis are shown in Appendix VIII. Seasonal changes in the estimated soil-moisture contents plotted for the eight locations are shown in Figures 27-33.

For Bobo-Dioulasso, Farako-Ba, and Gaoua located in the Southern Sudanian Zone (Figs. 27-29), the moisture availability for cropping is most favorable. At Bobo-Dioulasso the mean annual rainfall is 1064 mm, while the mean annual PE is 1938 mm; at Farako-Ba the mean annual rainfall is 1081 mm with a mean annual PE of 1742 mm; and at Gaoua the mean annual rainfall is 1213 mm with a mean annual PE of 1745 mm. The water storage is low in the dry season at these three locations. With the start of the rainy season around weeks 17-18 (end of April to beginning of May) the water storage of the soil increases steadily and reaches a maximum by late August (week 34). By this time at both the assumed water-storage capacities, the water storage of the soil is near its capacity. For a period of 20 weeks or 140 days, the water storage of the soil is at 50% of its capacity or above, reflecting thereby the potential that exists in the Southern Sudanian Zone for cropping. With good rainfall distribution and with the limited water-holding capacities assumed, runoff probabilities are considerably high in the Southern Sudanian Zone as shown in Appendix VIII. At Bobo-Dioulasso, Farako-Ba, and Gaoua at both the water-storage capacities, runoff in excess of 230 mm was predicted by the simulation model with the highest amounts occuring at Gaoua. This presents considerable scope for collection and use of runoff water.

In the Northern Sudanian Zone locations of Boromo, Fada N'Gourma, and Ouagadougou, with lesser rainfall as compared-to those in the Southern Sudanian Zone, the water storage of the soil is less especially in the beginning as well as the end of the rainy season (Figs. 30-32). The water storage of the soil is at 50% of its capacity or above for about 18 weeks. At Fada N'Gourma located in the eastern

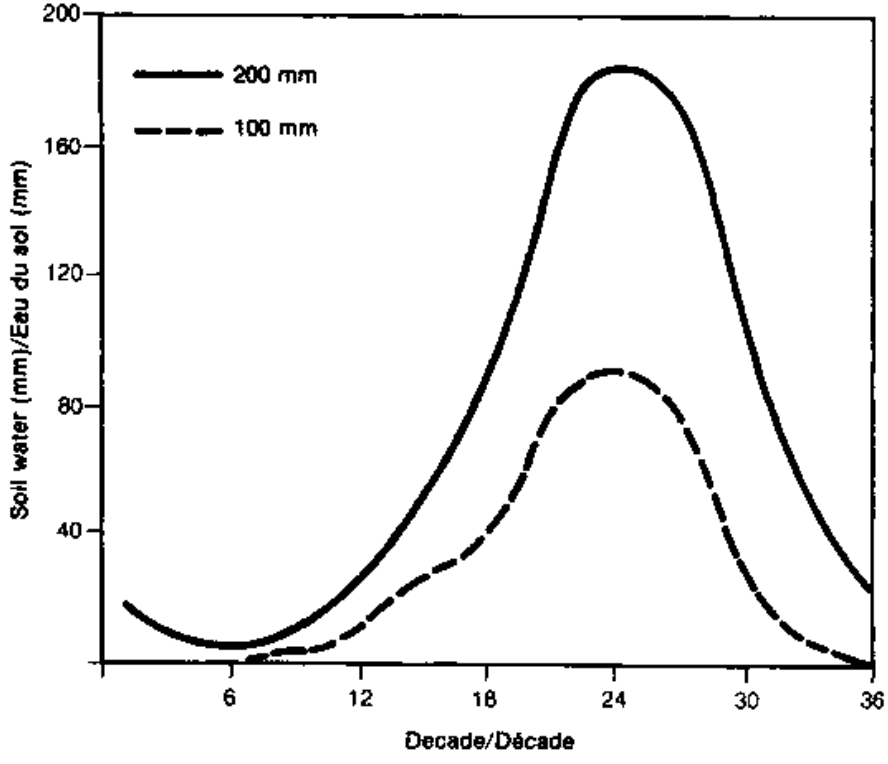


Figure 27. Decadal water storage of the soil at Bobo Dioulasso at two assumed water-holding capacities of the soil.

Figure 27. Sur une base décadaire, stock d'eau du sol à Bobo-Dioulasso à deux niveaux donnés de capacité de rétention d'eau du sol.

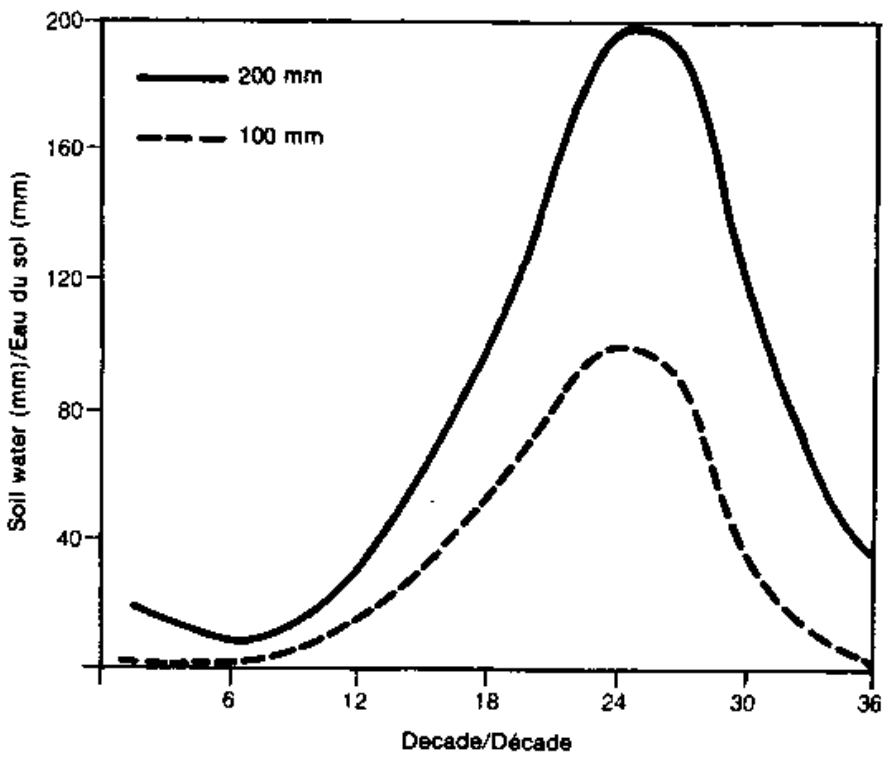


Figure 28. Decadal water storage of the soil at Farako Ba at two assumed water-holding capacities of the soil.

Figure 28. Sur une base décadaire, stock d'eau du sol à Farako Ba à deux niveaux donnés de capacité de rétention d'eau du sol.

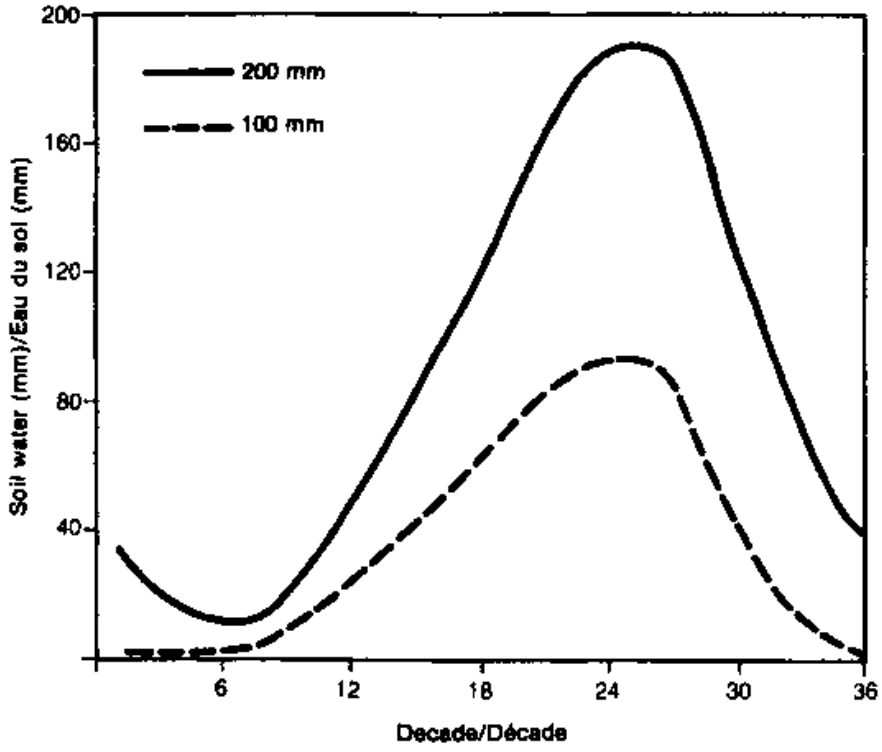


Figure 29. Decadal water storage of the soil at Gaoua at two assumed water-holding capacities of the soil.

Figure 29. Sur une base décadaire, stock d'eau du sol à Gaoua à deux niveaux donnés de capacité de rétention d'eau du sol.

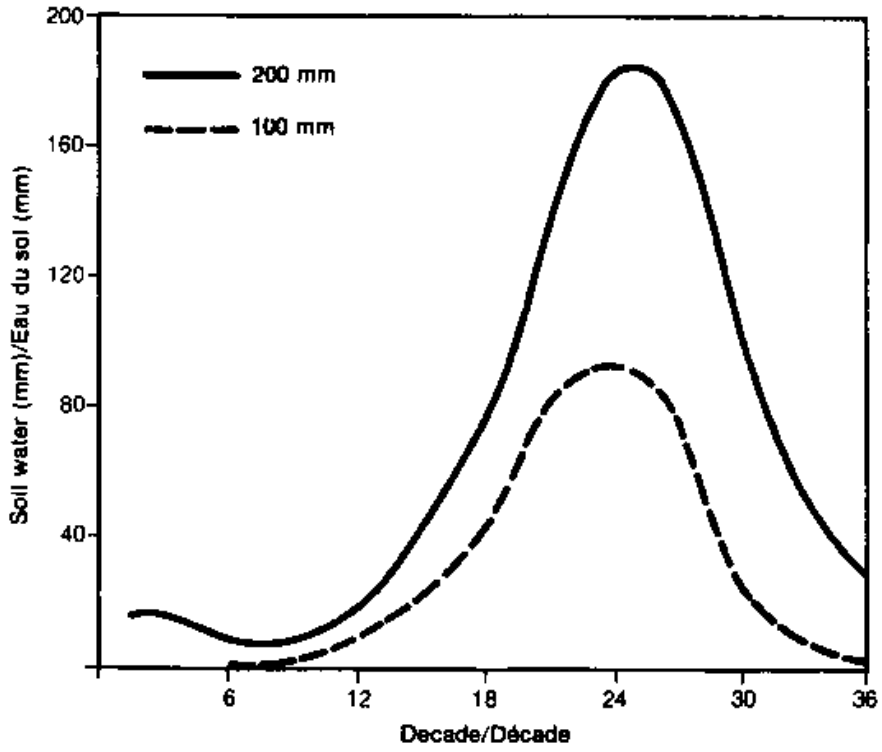


Figure 30. Decadal water storage of the soil at Boromo at two assumed water-holding capacities of the soil.

Figure 30. Sur une base décadaire, stock d'eau du sol à Boromo à deux niveaux donnés de capacité de rétention d'eau du sol.

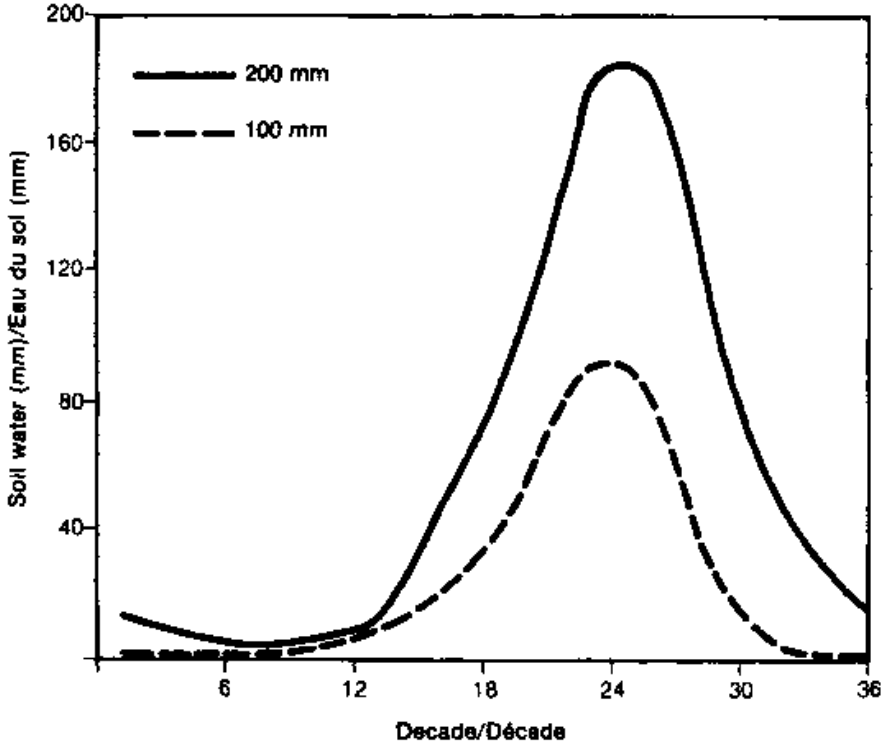


Figure 31. Decadal water storage of the soil at Fada N'Gourma at two assumed water-holding capacities of the soil.

Figure 31. Sur une base décadaire, stock d'eau du sol à Fada N'Gourma à deux niveaux donnés de capacité de rétention d'eau du sol.

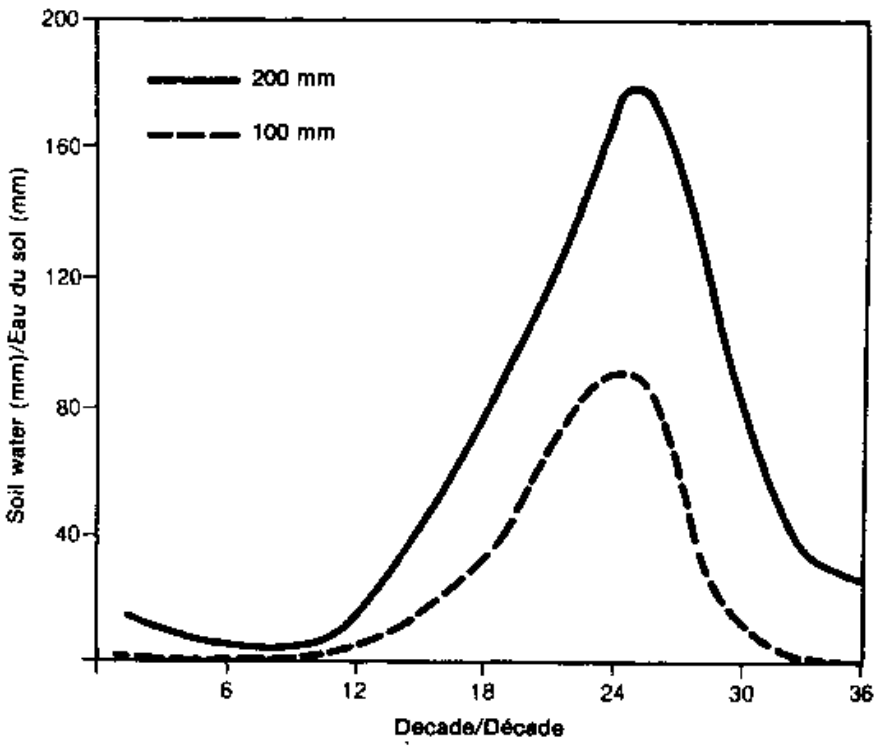


Figure 32. Decadal water storage of the soil at Ouagadougou at two assumed water-holding capacities of the soil.

Figure 32. Sur une base décadaire, stock d'eau du sol à Ouagadougou à deux niveaux donnés de capacité de rétention d'eau du sol.

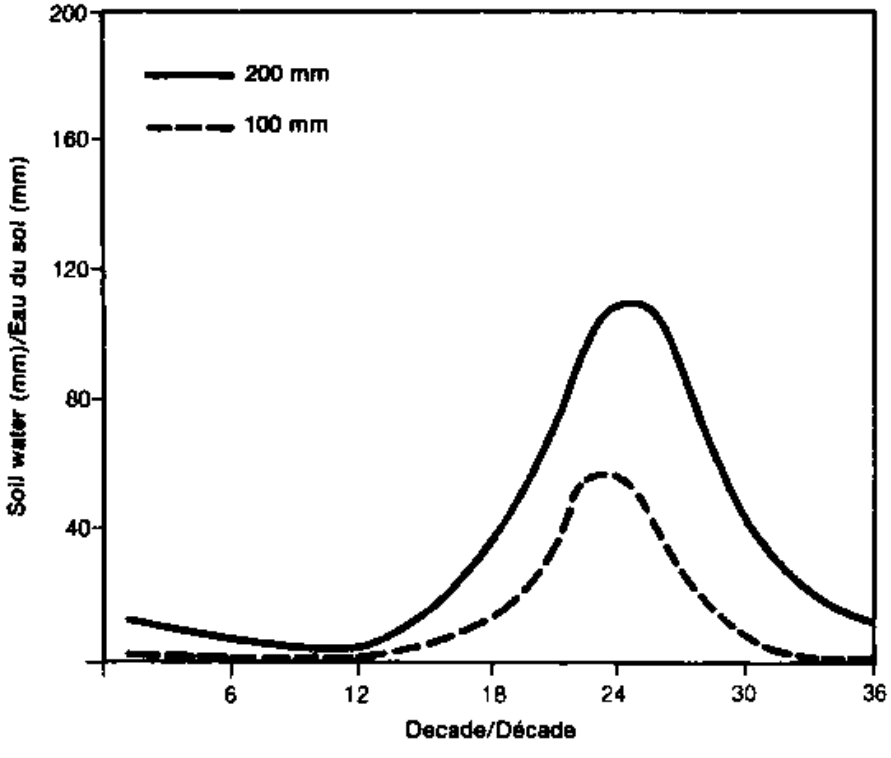


Figure 33. Decadal water storage of the soil at Dori at two assumed water-holding capacities of the soil.

Figure 33. Sur une base décadaire, stock d'eau du sol à Dori à deux niveaux donnés de capacité de rétention d'eau du sol.

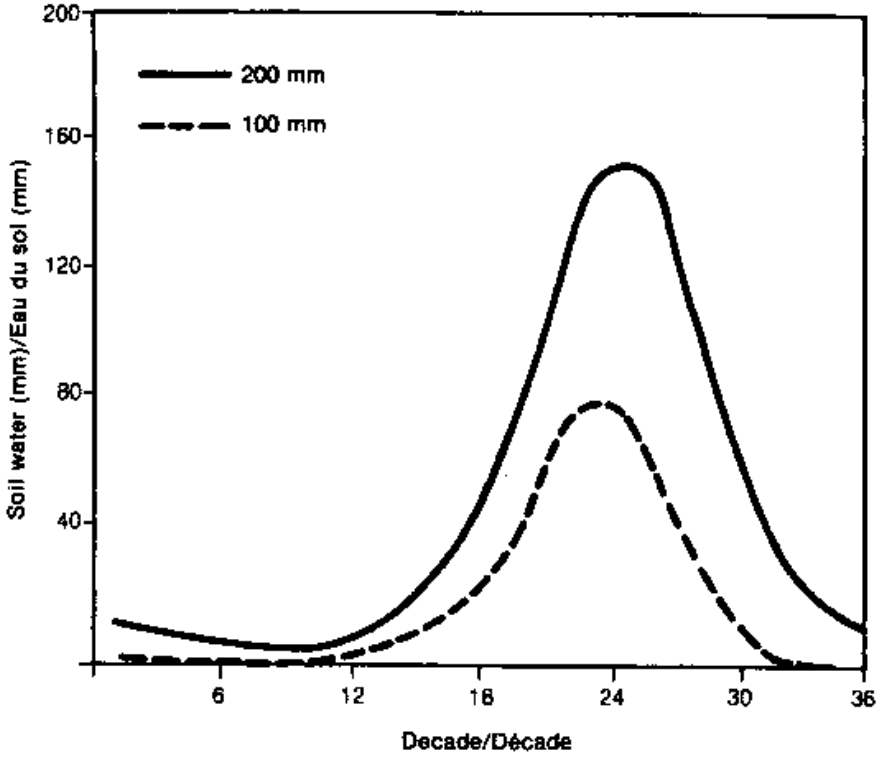


Figure 34. Decadal water storage of the soil at Ouahigouya at two assumed water-holding capacities of the soil.

Figure 34. Sur une base décadaire, stock d'eau du sol à Ouahigouya à deux niveaux donnés de capacité de rétention d'eau du sol.

region of the Northern Sudanian Zone this period is about 4 weeks less, i.e., 14 weeks due possibly to the differences discussed earlier in the movement of the ITCZ and in the rainfall patterns when compared to the western region.

The runoff in the Northern Sudanian Zone is less when compared to the runoff amounts discussed above for the Southern Sudanian Zone as can be seen from the data for Boromo, Fada N'Gourma, and Ouagadougou. At Boromo, which is located further south than the other two, the runoff is higher.

In the Sahelian Zone represented by Dori and Ouahigouya (Figs. 33 and 34), the water storage of the soil at both the assumed capacities is considerably less. The duration for which the soil storage is 50% of its capacity or above is considerably reduced when compared to the locations in the other two climatic zones. Runoff is also considerably less and water deficits of the soil during the rainy season are higher (Appendix VIII).

Although the water-balance analysis described here does not take into account the true water-holding capacities of the soil at the locations used, it serves the useful purpose of a comparative evaluation of the environmental potential in the three climatic zones.

Length of the Growing Season

The results of the water-balance analysis given in Appendix VIII also give the estimates of the decade-to-decade changes in the ratio of actual evapotranspiration to potential evapotranspiration (AE/PE). The length of the growing season at the eight locations in Burkina Faso could be computed on the assumption that it is the period when the available soil moisture is adequate to maintain a AE/PE ratio of 0.5 or more for consecutive decades. The length of the growing period (Table 9) varies from 90 days at Dori (100 mm water-holding capacity) to 210 days at Gaoua (200 mm water-holding capacity). The growing periods computed for Bobo-Dioulasso, Farako-Ba, and Gaoua indicate the existence of a definite potential for cropping. The soil-moisture availability is adequate to support long-duration crops such as cotton. In the Northern Sudanian Zone, the length of the growing period ranges from 150 days to 170 days reflecting enough potential for crops such as sorghum and groundnut. At Dori and Ouahigouya, the soil moisture availability is limited to support a short-duration crop of millet only. Even at a higher water-holding capacity assumed for Dori, the growing season is limited to only 90 days thereby showing that the amount and distribution of rainfall severely restrict cropping.

Table 9. Length of the growing season (days) in soils with two water-holding capacities for eight stations in Burkina Faso.

Station	Water-holding capacity of the soil	Length of the growing season
Bobo-Dioulasso	100	160
	200	180
Farako-Ba	100	170
	200	180
Gaoua	100	200
	200	210
Boromo	100	160
	200	170
Fada N'Gourma	100	150
	200	150
Ouagadougou	100	150
	200	150
Ouahigouya	100	110
	200	130
Dori	100	90
	200	90

Application of the Analysis

The application of the precipitation probabilities are numerous not only in agriculture but elsewhere in construction/ tourism, and hydrology. However, we will concern ourselves with only those that have application value in agriculture. The most-important application of decadal rainfall probabilities is in the decisions concerning planting of crops. As in other parts of West Africa, timely planting is a key to successful crop harvests in Burkina Faso. To characterize the success of a planting strategy wholly by means of rainfall probabilities is impractical since many other factors such as soil type, crop species/ variety, type of seed used/ etc./ also contribute to good crop establishment. However, the probability maps presented earlier could be used/ as a guide for planting decisions in the different climatic zones of Burkina Faso.

The planting decision should be tempered by not only the probability of receiving a specified amount of rainfall in a given decade but also the likelihood of continuity in the occurrence of these rains (as indicated by the conditional probabilities) in the

subsequent decades. For example, a comparison of the precipitation probabilities at Dori in the Sahelian Zone with Bobo-Dioulasso in the Southern Sudanian Zone provides a good contrast. Over 90% of the mean annual rainfall at Dori is received during a short period of 120 days. The probability of receiving at least 10 mm of rainfall (Appendix III) at Dori reaches 45% by the 1st decade of June (decade 16) and 62% by the 2nd decade of June (decade 17). But from the standpoint of crop establishment the wet/wet (W/W) probabilities are more revealing: these exceed 75% in these 2 decades and stay above that level for the subsequent decades, indicating thereby that sowing in the 1st or 2nd decade of June with rains is a good proposition. In comparison, at Bobo-Dioulasso by the 3rd decade of April (decade 11) the probability of receiving 10 mm of rain is 49% but the wet/wet (W/W) probability is only 57% suggesting that the continuity in rainfall could be expected in only 5 out of 10 years. However, by decade 14 (2nd decade of May) the initial (W) as well as conditional probabilities (W/W) exceed the dependable level of 70%, thereby suggesting reduced risk to crop establishment.

The growth and development during the growing season after establishment of a crop depends on the degree of adequacy of soil-moisture availability to meet the evapotranspirational demands of the crop. On a first approximation basis, one could compare the PE demand with the threshold rainfall probabilities. For example, if the PE for a given decade is 50 mm, use of computed rainfall probabilities of 50 mm or more could indicate in how many years out of 10, such demands could be met. The case of Bobo-Dioulasso could be used as an illustration (Appendix III). If we assume that a millet crop has been established by the 2nd decade of May (decade 14), within the next 50 days or 5 decades the crop is expected to reach the rapid vegetative-growth stage. Hence, one could examine for decade 19, the probabilities of meeting an assumed PE demand of 50 mm. The computed probabilities suggest that in 50% of the years this demand could be adequately met while 1/2 of the PE demand (look under 30-mm probability) could be met in 8 out of 10 years. Such an approach could be used as a basis for comparison of rainfall adequacy for crop growth at different locations. The results of gamma distribution analysis (Appendix V) could also be used to assess the risk levels to crop water needs. For example, a higher-probability level could be used to assess the expected rainfall at a lower risk level in a given decade. For the case of Bobo-Dioulasso (Appendix V) at a 25% risk level or 75% probability during decade 19, the expected rainfall is 25 mm confirming the earlier conclusion that 1/2 of the PE demand could be met in 8 out of 10 years while the full demand (50 mm) could be met in 50% of the years.

It is of course well known that variations in soil type govern the effectiveness of rainfall for crop growth. Hence, simple water-balance models, such as the one used in this analysis, could help evaluate the approximate soil-moisture storage and the amount of available water for the crop on a decadal basis. The length of the growing season computed from the simulated water balance could help in the choice of the appropriate crops/crop cultivars whose maturity duration matches the available length of the growing season.

In agricultural planning for a given region many other factors such as the socioeconomic situation of the farmer and the market demands play an important role. However, agrometeorological analysis where the available growing period is compared with the phenology of the crop and the climatic risks to crop production are delineated could help assess the potential for successful crop harvests.

References

Black, C.C. 1971. Ecological implications of dividing plants into groups with distinct photosynthetic production capacities. Advanced Ecological Research 7:87-114.

Church, R.J.H. 1985. Burkina Faso: Physical and social geography. Page 273 in Africa, South of the Sahara. 15th edn. London, UK: Europa Publication Ltd.

Cocheme, J., and Franquin, P. 1967. An agroclimatological survey of a semi-arid area in Africa south of the Sahara. Technical note no. 86. Geneva, Switzerland: World Meteorological Organization.

Editions Jeune Afrique. 1975. Grand Atlas de l'Afrique: Upper Volta. Paris, France: Editions Jeune Afrique.

FAO-UNESCO (Food and Agriculture Organization - United Nations Educational, Scientific and Cultural Organization). 1977. Soil map of the world. Vol VI. Africa. Paris, France: UNESCO. 299 pp.

FAO (Food and Agriculture Organization). 1979. Food demand projections 1975-2000. Rome, Italy: FAO.

FAO (Food and Agriculture Organization). 1981. FAO Production year book Vol. 35. Rome, Italy: FAO. 306 pp.

Gabriel, K.R., and Neumann, J. 1962. A Markov chain model for daily rainfall occurrence at Tel Aviv. Quarterly Journal of the Royal Meteorological Society 88:90-95.

Hargreaves, G.H. 1974. Precipitation dependability and potential for agricultural production in Northeast Brazil. EMBRAPA and Utah State University. Publication No. 74-D155. Logan, Utah, USA: Utah State University. 123 pp.

Bargreaves, G.H. 1975. Water requirement manual for irrigated crops and rainfed agriculture, EMBRAPA and Utah State University. Publication No. 74-D158. Brasilia, Brazil: EMBRAPA. 40 pp.

Jahnke, H.E. 1982. Livestock production systems and livestock development in tropical Africa. Kiel, West Germany: Kieler Wissenschaftsverlag Vauk. 253 pp.

Keig, G., and McAlpine, J.R. 1974. WATBAL: A computer system for the estimation and analysis of soil moisture from simple climatic data.

2nd edn. Technical Memorandum 74/4. Canberra, Australia: CSIRO. 45 pp.

Penman, H.L. 1948. Natural evaporation from open water, bare soil and grasses. Proceedings of Royal Society, London (A) 193:120-145.

Savonnet, G. 1976. Upper Volta. Pages 733-739 in World Atlas of Agriculture. Vol. IV: Africa. Novara, Italy: Instituto Geografico de Agostin.

Sivakumar, M.V.K., Konate, M., and Virmani, S.M. 1984. Agroclimatology of West Africa: Mali. Information Bulletin No.19. Patancheru, A.P., India: ICRISAT. 300 pp.

Sivakumar, M.V.K., Virmani, S.M., and Reddy, S.J. 1980. Rainfall climatology of West Africa: Niger. Information Bulletin No. 5. Patancheru, A.P., India: ICRISAT. 72 pp.

Troll, C. 1965. Seasonal climates of the earth. Page 28 in World Maps of Climatology (Rodenwalt, E., and Jusatz, H., eds.) Berlin: Springer-Verlag.

UNDP-FAO (United Nations Development Programme - Food and Agriculture Organization). 1980. Creation d'un service des sols Haute Volta etat des connaissances des sols. (In Fr.) Rome, Italy: UNDP-FAO. 33 pp.

Virmani, S.M., Sivakumar, M.V.K., and Reddy, S.J. 1978. Rainfall probability estimates for selected locations of semi-arid India. 1st edn. Research Bulletin No. 1. Patancheru, A.P., India: ICRISAT. 138 pp.

Virmani, S.M., Reddy, S.J., and Bose, M.N.S. 1980. A handbook on the rainfall climatology of West Africa: data for selected locations. Information Bulletin No. 7. Patancheru, A.P., India: ICRISAT. 56 pp.

APPENDIX I - Results of the Monthly Rainfall Analysis

APPENDICE I - Resultats de l'analyse de la pluviometrie mensuelle

Key for Appendix I/Cle pour Appendice I

Month/Mois

1 = January / Janvier

2 = February / Fevrier

3 = March / Mars

4 = April / Avril

5 = May / Mai

6 = June / Juin

7 = July / Juillet

8 = August / Aout

9 = September / Septembre

10 = October / Octobre

11 = November / Novembre

12 = December / Decembre

Bam

Month/ Mo1s	Mean rainfall/ Pluviometrie moyenne (mm)	Standard deviation/ Ecart type	Rainfall /Pluviometrie			Range/ Etendue
			CV (%)	Maximum (mm)	Minimum (mm)	
1	0.0	0.0	608.3	0.2	0.0	0.2
2	0.6	2.2	335.5	11.9	0.0	11.9
3	4.0	7.4	183.8	29.0	0.0	29.0
4	14.2	28.4	200.6	132.6	0.0	132.6
5	36.5	19.9	54.5	92.1	8.0	84.1
6	92.6	41.2	44.5	194.1	11.2	182.9
7	147.4	57.6	39.1	297.2	38.8	258.4
8	218.8	85.4	39.0	415.8	89.7	326.1
9	104.6	48.3	46.1	208.2	6.2	202.0
10	21.3	20.3	95.6	75.0	0.0	75.0
11	1.0	3.5	369.9	20.6	0.0	20.6
12	0.3	1.8	539.8	11.3	0.0	11.3
TOTAL	641.3	117.2	18.3	875.2	434.1	441.1

Banfora

Month/ Mo1s	Mean rainfall/ Pluviometrie moyenne (mm)	Standard deviation/ Ecart type	Rainfall /Pluviometrie			Range/ Etendue
			CV (%)	Maximum (mm)	Minimum (mm)	
1	1.3	5.2	398.8	34.5	0.0	34.5
2	5.7	14.1	248.9	93.8	0.0	93.8
3	19.0	23.0	121.0	80.6	0.0	80.6
4	59.9	41.6	69.4	192.2	1.8	190.4
5	108.8	60.0	55.1	309.2	18.8	290.4
6	143.8	64.6	45.0	339.3	40.8	298.5
7	205.9	67.2	32.6	389.5	72.0	317.5
8	302.5	112.2	37.1	648.9	92.9	556.0
9	205.7	77.1	37.5	408.3	76.0	332.3
10	72.8	51.4	70.5	239.5	0.0	239.5
11	19.4	24.3	125.6	95.9	0.0	95.9
12	2.9	7.3	248.7	37.3	0.0	37.3
TOTAL	1147.8	221.7	19.3	1693.6	544.3	1149.3

Batie

Month/ Mo1s	Mean rainfall/ Pluviometrie moyenne (mm)	Standard deviation/ Ecart type	Rainfall/Pluviometrie			
			CV (%)	Maximum (mm)	Minimum (mm)	Range/ Etendue
1	2.3	7.0	299.5	37.8	0.0	37.8
2	12.1	19.6	162.8	78.9	0.0	78.9
3	40.0	31.8	79.4	119.3	0.0	119.3
4	78.1	35.8	45.8	143.1	5.7	137.4
5	127.8	50.5	39.5	241.3	49.4	191.9
6	134.8	59.1	43.9	328.9	17.4	311.5
7	161.8	74.0	45.8	362.1	36.4	325.7
8	218.0	84.5	38.8	413.8	102.3	311.5
9	245.3	92.3	37.6	436.4	70.3	366.1
10	109.4	90.3	82.6	429.4	4.6	424.8
11	18.1	24.2	133.7	108.9	0.0	108.9
12	7.6	18.2	237.7	98.0	0.0	98.0
TOTAL	1155.3	270.8	23.4	1838.0	717.7	1120.3

Bobo-Dioulasso

Month/ Mo1s	Mean rainfall/ Pluviometrie moyenne (mm)	Standard deviation/ Ecart type	Rainfall/Pluviometrie			
			CV (%)	Maximum (mm)	Minimum (mm)	Range/ Etendue
1	0.9	3.3	391.6	20.3	0.0	20.3
2	3.1	7.2	232.7	36.2	0.0	36.2
3	19.8	30.8	155.4	203.0	0.0	203.0
4	46.8	31.0	66.3	136.8	0.0	136.8
5	103.6	51.1	49.3	262.8	21.0	241.8
6	126.0	40.5	32.1	288.3	37.8	250.5
7	209.5	85.3	40.7	426.7	41.5	385.2
8	295.0	93.9	31.8	608.5	116.1	492.4
9	195.3	66.9	34.2	401.8	72.7	329.1
10	67.6	42.9	63.5	242.5	2.8	239.7
11	11.0	17.4	158.0	110.8	0.0	110.8
12	1.7	5.6	339.2	33.0	0.0	33.0
TOTAL	1080.2	231.9	21.5	1551.6	305.4	1246.2

Bogande

Month/ Mois	Mean rainfall/ Pluviometrie moyenne (mm)	Standard deviation/ Ecart type	Rainfall/Pluviometrie CV (%)	Maximum (mm)	Minimum (mm)	Range/ Etendue
1	0.0	0.0	0.0	0.0	0.0	0.0
2	0.0	0.0	0.0	0.0	0.0	0.0
3	0.8	2.2	287.6	9.1	0.0	9.1
4	14.4	25.0	173.2	118.6	0.0	118.6
5	56.3	34.6	61.4	131.6	1.4	130.2
6	84.8	34.8	41.1	194.0	25.6	168.4
7	154.4	59.1	38.3	305.3	61.1	244.2
8	192.7	72.5	37.6	425.6	88.0	337.6
9	118.9	56.8	47.8	306.6	27.2	279.4
10	24.9	29.6	118.6	124.1	0.0	124.1
11	2.9	11.2	389.2	59.5	0.0	59.5
12	0.2	0.6	358.8	2.5	0.0	2.5
TOTAL	650.3	131.4	20.2	956.2	353.7	602.5

Boromo

Month/ Mois	Mean rainfall / Pluviometrie moyenne (mm)	Standard deviation/ Ecart type	Rainfall/Pluviometrie CV (%)	Maximum (mm)	Minimum (mm)	Range/ Etendue
1	0.7	4.4	631.3	34.3	0.0	34.3
2	0.3	1.4	424.5	9.5	0.0	9.5
3	6.5	11.8	183.3	58.4	0.0	58.4
4	30.3	25.2	83.4	118.8	0.0	118.8
5	88.7	43.6	49.1	227.9	10.8	217.1
6	121.1	47.3	39.0	259.9	45.5	214.4
7	195.9	73.1	37.3	501.4	63.9	437.5
8	271.1	98.3	36.2	719.1	108.6	610.5
9	180.9	68.5	37.9	397.4	64.0	333.4
10	49.1	35.9	73.0	158.1	1.7	156.4
11	6.3	13.8	219.7	75.6	0.0	75.6
12	1.1	4.4	399.0	27.9	0.0	27.9
TOTAL	951.9	195.5	20.5	1681.5	539.3	1142.2

Dedougou

Month/ Mois	Mean rainfall/ Pluviometrie moyenne (mm)	Standard deviation/ Ecart type	Rainfall/Pluviometrie			Range/ Etendue
			CV (%)	Maximum (mm)	Minimum (mm)	
1	1.1	7.1	630.6	56.5	0.0	56.5
2	1.3	4.8	357.9	30.9	0.0	30.9
3	6.4	15.0	232.7	79.1	0.0	79.1
4	25.6	34.7	135.5	188.5	0.0	188.5
5	67.5	45.1	66.8	200.7	0.0	200.7
6	115.9	49.9	43.1	237.0	0.0	237.0
7	208.9	67.6	32.4	383.4	96.3	287.1
8	264.7	94.0	35.5	635.6	118.6	517.0
9	162.2	64.2	39.6	350.0	46.8	303.2
10	50.0	40.0	80.1	188.8	0.0	188.8
11	3.4	10.1	296.1	72.4	0.0	72.4
12	0.3	2.2	781.9	18.0	0.0	18.0
TOTAL	907.3	185.1	20.4	1519.4	395.6	1123.8

Diapaga

Month/ Mois	Mean rainfall/ Pluviometrie moyenne (mm)	Standard deviation/ Ecart type	Rainfall/Pluviometrie			Range/ Etendue
			CV (%)	Maximum (mm)	Minimum (mm)	
1	0.3	1.9	605.0	13.5	0.0	13.5
2	1.5	4.8	329.8	27.0	0.0	27.0
3	5.8	8.4	145.8	37.1	0.0	37.1
4	26.3	25.5	96.9	113.9	0.0	113.9
5	81.1	44.6	55.1	235.7	0.0	235.7
6	116.1	42.3	36.4	231.0	42.2	188.8
7	172.0	57.7	33.6	320.0	40.6	279.4
8	246.9	90.2	36.5	491.2	87.5	403.7
9	159.0	57.7	36.3	348.0	65.8	282.2
10	31.3	29.0	92.7	133.1	0.0	133.1
11	3.8	8.7	227.4	40.0	0.0	40.0
12	0.0	0.2	679.9	1.5	0.0	1.5
TOTAL	844.0	161.4	19.1	1314.7	497.7	817.0

Diebougou

Month/ Mois	Mean rainfall/ Pluviometrie moyenne (mm)	Standard deviation/ Ecart type	CV (%)	Rainfall/Pluviometrie Maximum (mm)	Rainfall/Pluviometrie Minimum (mm)	Range/ Etendue
1	0.1	0.6	768.8	4.8	0.0	4.8
2	3.0	9.4	310.2	59.0	0.0	59.0
3	18.7	24.5	131.1	120.3	0.0	120.3
4	50.4	36.2	71.9	143.9	0.0	143.9
5	105.8	59.4	56.1	285.5	27.0	258.5
6	150.9	73.2	48.5	491.8	38.1	453.7
7	183.3	72.2	39.4	392.0	51.2	340.8
8	254.9	91.2	35.8	568.0	76.0	492.0
9	195.0	67.3	34.5	444.0	103.0	341.0
10	63.2	50.2	79.3	232.4	4.4	228.0
11	10.7	24.4	228.6	155.8	0.0	155.8
12	1.8	10.1	577.4	79.4	0.0	79.4
TOTAL	1037.7	237.9	22.9	1884.2	281.6	1602.6

Djibo

Month/ Mois	Mean rainfall/ Pluviometrie moyenne (mm)	Standard deviation/ Ecart type	Rainfall /Pluviometrie CV (%)	Rainfall /Pluviometrie Maximum (mm)	Rainfall /Pluviometrie Minimum (mm)	Range/ Etendue
1	0.0	0.0	0.0	0.0	0.0	0.0
2	0.1	0.5	788.8	3.7	0.0	3.7
3	0.6	2.3	360.5	13.8	0.0	13.8
4	3.1	6.6	217.0	41.5	0.0	41.5
5	23.5	20.4	86.7	82.4	0.2	82.2
6	60.7	40.3	66.3	213.2	7.9	205.3
7	129.2	51.2	39.6	285.4	25.6	259.8
8	167.3	57.6	34.4	317.1	52.6	264.5
9	79.8	44.5	55.7	244.0	9.5	234.5
10	15.7	20.8	132.2	97.9	0.0	97.9
11	0.1	0.6	5 92.3	4.5	0.0	4.5
12	0.1	0.4	788.1	3.4	0.0	3.4
TOTAL	480.2	162.7	33.9	783.7	262.0	521.7

Dori

Month/ Mois	Mean rainfall/ Pluviometrie moyenne (mm)	Standard deviation/ Ecart type	CV (%)	Rainfall/Pluviometrie Maximum (mm)	Rainfall/Pluviometrie Minimum (mm)	Range/ Etendue
1	0.0	0.0	0.0	0.0	0.0	0.0
2	0.1	0.5	788.8	3.7	0.0	3.7
3	0.6	2.3	360.5	13.8	0.0	13.8
4	3.1	6.6	217.0	41.5	0.0	41.5
5	23.5	20.4	86.7	82.4	0.2	82.2
6	60.7	40.3	66.3	213.2	7.9	205.3
7	129.2	51.2	39.6	285.4	25.6	259.8
8	167.3	57.6	34.4	317.1	52.6	264.5
9	79.8	44.5	55.7	244.0	9.5	234.5
10	15.7	20.8	132.2	97.9	0.0	97.9
11	0.1	0.6	5 92.3	4.5	0.0	4.5
12	0.1	0.4	788.1	3.4	0.0	3.4
TOTAL	480.2	162.7	33.9	783.7	0.0	783.7

Fada N'Gourma

Month/ Mois	Mean rainfall/ Pluviometrie moyenne (mm)	Standard deviation/ Ecart type	CV (%)	Rainfall/Pluviometrie Maximum (mm)	Rainfall/Pluviometrie Minimum (mm)	Range/ Etendue
1	0.0	0.0	0.0	0.0	0.0	0.0
2	0.4	2.2	498.0	17.3	0.0	17.3
3	6.2	12.7	204.1	82.9	0.0	82.9
4	25.1	23.5	93.5	97.4	0.0	97.4
5	79.1	37.6	47.5	185.0	7.5	177.5
6	124.7	41.0	32.8	198.0	58.0	140.0
7	182.3	62.1	34.1	387.7	60.1	327.6
8	249.9	82.3	32.9	526.8	65.9	460.9
9	159.2	63.7	40.0	348.1	39.6	308.5
10	29.6	29.8	100.8	153.3	0.0	153.3
11	1.0	2.8	270.6	15.0	0.0	15.0
12	0.3	1.9	743.8	15.6	0.0	15.6
TOTAL	858.0	144.3	16.8	1312.5	569.3	743.2

Gaoua

Month/ Mois	Mean rainfall/ Pluviometrie moyenne (mm)	Standard deviation/ Ecart type	Rainfall /Pluviometrie CV (%)	Maximum (mm)	Minimum (mm)	Range/ Etendue
1	2.1	11.4	541.8	94.6	0.0	94.6
2	6.1	11.6	191.4	59.5	0.0	59.5
3	31.4	28.5	90.8	125.0	0.0	125.0
4	77.4	51.7	66.7	266.2	6.6	259.6
5	137.8	62.3	45.2	345.0	33.6	311.4
6	155.4	62.2	40.0	418.0	52.9	365.1
7	206.3	106.5	51.6	597.0	39.0	558.0
8	259.3	126.6	48.8	665.0	68.0	597.0
9	226.1	82.1	36.3	493.7	97.8	395.9
10	89.3	55.6	62.3	303.3	1.3	302.0
11	19.5	26.4	135.6	100.1	0.0	100.1
12	3.4	10.5	305.0	73.6	0.0	73.6
TOTAL	1214.1	335.5	27.6	2133.0	709.6	1423.4

Garango

Month/ Mois	Mean rainfall/ Pluviometrie moyenne (mm)	Standard deviation/ Ecart type	Rainfall/Pluviometrie CV (%)	Maximum (mm)	Minimum (mm)	Range/ Etendue
1	0.6	3.4	577.8	21.0	0.0	21.0
2	5.7	15.8	278.2	79.0	0.0	79.0
3	10.6	21.9	206.2	112.4	0.0	112.4
4	28.1	27.3	96.9	115.5	0.0	115.5
5	81.7	44.2	54.0	217.1	0.0	217.1
6	100.7	44.8	44.5	231.3	0.0	231.3
7	181.7	68.3	37.6	332.8	76.5	256.3
8	253.5	65.3	25.8	403.1	153.4	249.7
9	165.6	62.2	37.6	288.8	0.0	288.8
10	40.2	37.7	93.8	152.5	0.0	152.5
11	1.6	4.1	261.5	19.0	0.0	19.0
12	1.3	4.6	356.3	25.0	0.0	25.0
TOTAL	871.2	135.3	15.5	1129.7	554.6	575.1

Hounde

Month/ Mois	Mean rainfall/ Pluviometrie moyenne (mm)	Standard deviation/ Ecart type	CV (%)	Rainfall/Pluviometrie Maximum (mm)	Rainfall/Pluviometrie Minimum (mm)	Range/ Etendue
1	0.5	1.8	350.1	9.8	0.0	9.8
2	3.6	10.0	280.9	49.6	0.0	49.6
3	7.6	12.1	160.1	59.0	0.0	59.0
4	40.4	30.4	75.4	109.5	0.0	109.5
5	90.7	44.1	48.6	206.0	16.0	190.0
6	127.5	50.0	39.2	261.5	28.9	232.6
7	198.4	63.4	31.9	354.4	63.0	291.4
8	263.0	75.2	28.6	400.9	89.4	311.5
9	188.5	67.2	35.6	357.4	88.7	268.7
10	58.2	43.6	75.0	170.5	0.0	170.5
11	10.7	18.5	172.1	72.0	0.0	72.0
12	2.0	6.3	315.2	32.0	0.0	32.0
TOTAL	990.9	174.1	17.6	1422.1	555.5	866.6

Kantchari

Month/ Mois	Mean rainfall/ Pluviometrie moyenne (mm)	Standard deviation/ Ecart type	Rainfall/Pluviometrie CV (%)	Rainfall/Pluviometrie Maximum (mm)	Rainfall/Pluviometrie Minimum (mm)	Range/ Etendue
1	0.0	0.0	0.0	0.0	0.0	0.0
2	0.1	0.7	560.5	4.3	0.0	4.3
3	3.6	6.8	190.2	27.7	0.0	27.7
4	16.7	17.1	102.3	79.6	0.0	79.6
5	64.8	38.2	59.0	219.0	4.0	215.0
6	115.4	47.9	41.5	245.7	42.1	203.6
7	182.5	63.2	34.6	340.7	80.0	260.7
8	232.4	78.7	33.9	471.5	83.0	388.5
9	135.5	52.2	38.5	259.0	36.0	223.0
10	26.7	35.9	134.8	148.3	0.0	148.3
11	0.9	3.6	399.7	21.0	0.0	21.0
12	0.1	0.4	411.7	2.2	0.0	2.2
TOTAL	778.7	136.8	17.6	1050.7	500.7	550.0

Kaya

Month/ Mois	Mean rainfall/ Pluviometrie moyenne (mm)	Standard deviation/ Ecart type	CV (%)	Rainfall/Pluviometrie		Range/ Etendue
				Maximum (mm)	Minimum (mm)	
1	0.0	0.0	0.0	0.0	0.0	0.0
2	0.5	1.6	351.5	9.5	0.0	9.5
3	3.1	10.9	353.3	83.8	0.0	83.8
4	9.4	15.0	158.7	91.0	0.0	91.0
5	45.6	32.6	71.6	128.1	0.0	128.1
6	97.2	44.8	46.1	252.0	15.1	236.9
7	160.5	52.8	32.9	373.4	50.2	323.2
8	227.6	82.6	36.3	583.2	96.0	487.2
9	122.3	52.7	43.1	256.6	9.4	247.2
10	25.4	29.9	117.5	154.2	0.0	154.2
11	2.0	5.4	272.8	30.4	0.0	30.4
12	0.2	1.4	782.3	11.8	0.0	11.8
TOTAL	693.9	127.4	18.4	1007.7	458.2	549.5

Koudougou

Month/ Mois	Mean rainfall/ Pluviometrie moyenne (mm)	Standard deviation/ Ecart type	CV (%)	Rainfall /Pluviometrie		Range/ Etendue
				Maximum (mm)	Minimum (mm)	
1	0.0	0.0	0.0	0.0	0.0	0.0
2	1.0	3.6	344.7	19.6	0.0	19.6
3	5.2	9.7	187.5	43.2	0.0	43.2
4	21.6	19.2	89.0	83.6	0.0	83.6
5	60.6	38.2	63.0	225.7	0.0	225.7
6	105.8	48.5	45.9	242.0	0.0	242.0
7	176.9	61.9	35.0	293.5	57.7	235.8
8	248.8	78.6	31.6	493.0	112.2	380.8
9	164.2	68.3	41.6	402.3	37.2	365.1
10	45.1	31.3	69.4	150.6	0.0	150.6
11	2.8	5.9	207.7	27.5	0.0	27.5
12	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	832.0	170.9	20.5	1229.4	503.2	726.2

Koupela

Month/ Mois	Mean rainfall/ Pluviometrie moyenne (mm)	Standard deviation/ Ecart type	CV (%)	Rainfall/Pluviometrie Maximum (mm)	Rainfall/Pluviometrie Minimum (mm)	Range/ Etendue
1	0.8	4.8	637.4	37.1	0.0	37.1
2	1.4	4.2	303.6	22.4	0.0	22.4
3	7.4	16.7	225.5	112.6	0.0	112.6
4	23.1	22.0	95.1	73.7	0.0	73.7
5	75.9	46.8	61.6	243.8	0.0	243.8
6	108.3	41.0	37.8	200.7	1.4	199.3
7	165.4	51.6	31.2	340.5	67.4	273.1
8	247.6	66.3	26.8	405.0	91.0	314.0
9	150.8	64.6	42.8	407.5	48.3	359.2
10	34.3	35.9	104.6	167.4	0.0	167.4
11	2.9	8.4	291.1	58.3	0.0	58.3
12	0.2	1.2	504.3	7.2	0.0	7.2
TOTAL	818.1	151.9	18.6	1377.4	490.0	887.4

Leo

Month/ Mois	Mean rainfall/ Pluviometrie moyenne (mm)	Standard deviation/ Ecart type	CV (%)	Rainfall/Pluviometrie Maximum (mm)	Rainfall/Pluviometrie Minimum (mm)	Range/ Etendue
1	1.3	5.9	437.7	39.1	0.0	39.1
2	2.1	9.3	447.8	71.9	0.0	71.9
3	15.2	21.5	141.1	98.0	0.0	98.0
4	50.7	34.7	68.4	153.3	0.0	153.3
5	98.7	42.4	43.0	210.3	0.0	210.3
6	124.5	45.0	36.1	225.9	39.4	186.5
7	184.3	64.0	34.7	415.1	53.0	362.1
8	247.9	92.3	37.2	485.1	104.3	380.8
9	192.4	65.4	34.0	353.0	46.0	307.0
10	52.4	43.5	83.1	197.5	0.0	197.5
11	8.1	15.7	193.1	76.0	0.0	76.0
12	1.5	6.3	423.3	40.0	0.0	40.0
TOTAL	979.1	188.3	19.2	1383.1	625.2	757.9

Manga

Month/ Mois	Mean rainfall/ Pluviometrie moyenne (mm)	Standard deviation/ Ecart type	CV (%)	Rainfall/Pluviometrie Maximum (mm)	Rainfall/Pluviometrie Minimum (mm)	Range/ Etendue
1	0.7	3.8	570.3	22.6	0.0	22.6
2	1.9	6.2	325.9	35.7	0.0	35.7
3	9.7	11.2	114.9	37.5	0.0	37.5
4	35.2	27.1	77.1	127.0	0.0	127.0
5	89.2	32.9	36.9	167.0	36.4	130.6
6	113.8	42.0	36.9	194.2	31.6	162.6
7	166.5	49.1	29.5	294.4	97.4	197.0
8	252.5	86.5	34.3	470.6	0.0	470.6
9	162.3	64.3	39.6	299.0	0.0	299.0
10	44.0	46.0	104.5	216.0	0.0	216.0
11	3.9	7.6	194.7	29.8	0.0	29.8
12	1.1	3.3	291.0	14.2	0.0	14.2
TOTAL	880.9	153.6	17.4	1244.8	387.3	857.5

Markoye

Month/ Mois	Mean rainfall/ Pluviometrie moyenne (mm)	Standard deviation/ Ecart type	CV (%)	Rainfall/Pluviometrie Maximum (mm)	Rainfall/Pluviometrie Minimum (mm)	Range/ Etendue
1	0.0	0.0	0.0	0.0	0.0	0.0
2	0.0	0.0	0.0	0.0	0.0	0.0
3	0.4	2.0	521.6	11.3	0.0	11.3
4	3.1	7.8	248.5	38.5	0.0	38.5
5	12.2	13.0	106.5	52.4	0.0	52.4
6	56.6	37.2	65.8	147.7	1.6	146.1
7	105.9	41.8	39.5	183.8	16.1	167.7
8	134.3	44.0	32.8	253.1	50.3	202.8
9	62.3	29.8	47.9	138.7	17.5	121.2
10	15.8	21.6	136.6	84.0	0.0	84.0
11	0.4	1.8	497.9	9.6	0.0	9.6
12	0.5	1.7	375.2	9.2	0.0	9.2
TOTAL	391.4	104.6	26.7	684.4	215.8	468.6

Nouna

Month/ Mois	Mean rainfall/ Pluviometrie moyenne (mm)	Standard deviation/ Ecart type	CV (%)	Rainfall/Pluviometrie Maximum (mm)	Rainfall/Pluviometrie Minimum (mm)	Range/ Etendue
1	0.5	2.2	409.3	14.0	0.0	14.0
2	2.5	9.1	367.5	43.5	0.0	43.5
3	3.9	8.7	226.2	41.9	0.0	41.9
4	15.8	19.2	121.2	91.0	0.0	91.0
5	59.6	34.1	57.1	183.9	4.4	179.5
6	117.6	42.7	36.3	238.3	24.3	214.0
7	190.3	67.0	35.2	395.8	101.7	294.1
8	240.1	82.9	34.5	447.6	98.5	349.1
9	135.5	56.7	41.9	300.9	49.1	251.8
10	43.2	30.2	69.9	123.7	0.0	123.7
11	3.1	7.2	230.2	34.6	0.0	34.6
12	1.3	5.1	393.2	29.5	0.0	29.5
TOTAL	813.5	140.6	17.3	1083.2	482.5	600.7

Ouagadougou

Month/ Mois	Mean rainfall/ PluvlometMe moyenne (mm)	Standard deviation/ Ecart type	CV *(%)*	Rainfall/Pluviometrie Maximum (mm)	Rainfall/Pluviometrie Minimum (mm)	Range/ Etendue
1	0.1	0.6	588.2	4.6	0.0	4.6
2	1.7	5.2	299.9	24.8	0.0	24.8
3	5.6	9.8	175.8	45.0	0.0	45.0
4	20.5	23.0	112.2	135.3	0.0	135.3
5	73.4	49.3	67.2	226.0	7.9	218.1
6	114.8	47.9	41.7	313.7	46.0	267.7
7	187.8	51.2	27.3	307.0	77.0	230.0
8	261.7	88.9	34.0	673.4	136.5	536.9
9	150.0	54.1	36.1	282.3	57.4	224.9
10	36.2	32.7	90.3	147.4	0.0	147.4
11	2.4	8.4	352.7	60.3	0.0	60.3
12	0.4	2.5	630.9	19.1	0.0	19.1
TOTAL	854.6	140.1	16.4	1192.1	498.6	693.5

Ouahigouya

Month/ Mois	Mean rainfall/ Pluviometrie moyenne (mm)	Standard deviation/ Ecart type	CV (%)	Rainfall/Pluviometrie Maximum (mm)	Rainfall/Pluviometrie Minimum (mm)	Range/ Etendue
1	0.1	0.6	570.7	4.0	0.0	4.0
2	0.1	1.1	736.5	8.5	0.0	8.5
3	1.7	5.4	324.2	31.5	0.0	31.5
4	10.9	17.9	164.1	81.5	0.0	81.5
5	33.8	29.1	86.3	124.5	0.0	124.5
6	87.8	38.6	43.9	179.8	1.0	178.8
7	163.2	58.2	35.6	332.3	67.6	264.7
8	207.5	74.2	35.8	401.6	97.8	303.8
9	114.4	44.2	38.7	283.8	34.8	249.0
10	28.2	29.7	105.1	149.3	0.0	149.3
11	0.9	3.0	353.0	15.3	0.0	15.3
12	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	648.5	192.7	29.7	971.4	413.0	558.4

Pama

Month/ Mois	Mean rainfall/ Pluviometrie moyenne (mm)	Standard deviation/ Ecart type	CV (%)	Rainfall/Pluviometrie Maximum (mm)	Rainfall/Pluviometrie Minimum (mm)	Range/ Etendue
1	0.0	0.0	0.0	0.0	0.0	0.0
2	2.4	6.9	282.1	34.2	0.0	34.2
3	12.7	18.8	148.5	78.5	0.0	78.5
4	36.6	26.3	71.8	96.8	0.0	96.8
5	89.7	51.1	57.0	300.2	37.1	263.1
6	125.2	40.6	32.4	200.6	13.4	187.2
7	189.6	69.9	36.9	322.1	41.2	280.9
8	247.4	89.9	36.3	570.2	117.0	453.2
9	198.7	72.6	36.5	421.3	56.6	364.7
10	43.7	32.0	73.2	140.3	0.0	140.3
11	2.1	7.3	347.1	39.2	0.0	39.2
12	0.2	0.7	433.6	3.9	0.0	3.9
TOTAL	948.3	160.0	16.9	1257.8	586.0	671.8

Po

Month/ Mois	Mean rainfall/ Pluviometrie moyenne (mm)	Standard deviation/ Ecart type	CV (%)	Rainfall /Pluviometrie Maximum (mm)	Rainfall /Pluviometrie Minimum (mm)	Range/ Etendue
1	0.0	0.0	0.0	0.0	0.0	0.0
2	3.5	10.7	304.5	64.0	0.0	64.0
3	12.4	16.3	131.5	63.5	0.0	63.5
4	41.7	34.2	82.0	138.8	0.0	138.8
5	92.3	45.0	48.8	209.4	25.5	183.9
6	127.8	50.5	39.5	279.6	49.8	229.8
7	171.8	55.5	32.3	290.1	74.0	216.1
8	261.3	88.2	33.8	568.0	109.5	458.5
9	182.2	63.1	34.6	309.0	48.2	260.8
10	47.7	37.9	79.3	183.3	0.0	183.3
11	5.0	9.8	194.2	35.7	0.0	35.7
12	1.8	5.5	311.3	26.7	0.0	26.7
TOTAL	947.5	171.6	18.1	1429.0	546.4	882.6

Saria

Month/ Mois	Mean rainfall/ Pluvlometrle moyenne (mm)	Standard deviation/ Ecart type	CV (%)	Rainfall /Pluviometrie Maximum (mm)	Rainfall /Pluviometrie Minimum (mm)	Range/ Etendue
1	0.0	0.0	0.0	0.0	0.0	0.0
2	0.7	2.1	288.6	10.5	0.0	10.5
3	4.0	7.3	181.6	30.0	0.0	30.0
4	25.2	25.5	101.3	131.9	0.0	131.9
5	68.2	32.4	47.6	143.2	6.6	136.6
6	114.1	39.1	34.3	183.3	30.3	153.0
7	176.2	61.6	35.0	311.6	48.8	262.8
8	235.9	71.8	30.4	452.2	123.0	329.2
9	156.0	63.8	40.9	331.9	49.3	282.6
10	36.2	29.6	81.7	118.9	0.0	118.9
11	1.6	3.4	211.8	14.8	0.0	14.8
12	0.6	3.1	513.8	19.5	0.0	19.5
TOTAL	818.7	130.6	16.0	1091.8	568.7	523.1

Tenkodogo

Month/ Mo1s	Mean rainfall/ Pluvlometrle moyenne (mm)	Standard deviation/ Ecart type	CV (%)	Rainfall/Pluviometrie Max1mum (mm)	Minimum (mm)	Range/ Etendue
1	0.4	3.3	754.1	26.7	0.0	26.7
2	1.8	7.6	429.2	57.4	0.0	57.4
3	8.9	20.6	231.5	128.8	0.0	128.8
4	29.1	28.3	97.4	126.4	0.0	126.4
5	87.1	52.5	60.3	285.8	15.3	270.5
6	110.6	46.8	42.4	237.5	40.0	197.5
7	165.3	65.6	39.7	316.0	65.0	251.0
8	258.2	96.6	37.4	614.4	121.2	493.2
9	176.3	60.6	34.4	331.0	68.5	262.5
10	36.1	36.8	101.7	195.0	0.0	195.0
11	2.3	5.3	231.7	23.6	0.0	23.6
12	0.3	1.5	429.8	9.1	0.0	9.1
TOTAL	876.5	281.9	32.2	1528.3	194.0	1334.3

Tougan

Month/ Mo1s	Mean rainfall/ Pluviometrie moyenne (mm)	Standard deviation/ Ecart type	CV (%)	Rainfall /Pluviometrie Maximum (mm)	Minimum (mm)	Range/ Etenduf
1	0.2	1.3	732.7	10.5	0.0	10.5
2	0.2	1.1	547.6	8.6	0.0	8.6
3	3.9	10.6	271.2	62.5	0.0	62.5
4	12.0	20.0	166.3	99.8	0.0	99.8
5	34.2	30.9	90.4	164.7	0.0	164.7
6	77.3	40.5	52.4	228.0	30.8	197.2
7	136.2	60.7	44.5	374.5	58.9	315.6
8	198.1	90.1	45.5	482.0	89.7	392.3
9	108.2	53.2	49.2	298.7	27.2	271.5
10	27.8	26.7	95.8	111.5	0.0	111.5
11	6.7	29.2	432.3	211.0	0.0	211.0
12	1.5	8.4	540.1	65.1	0.0	65.1
TOTAL	606.4	314.2	51.8	1209.6	318.0	891.6

Month/ Mois	Mean rainfall/ Pluviometrie moyenne (mm)	Standard deviation/ Ecart type	Rainfall/Pluviometrie			
			CV (%)	Maximum (mm)	Minimum (mm)	Range/ Etendue
1	0.0	0.0	0.0	0.0	0.0	0.0
2	0.2	0.6	334.8	2.5	0.0	2.5
3	3.3	8.3	251.3	45.0	0.0	45.0
4	16.4	29.5	180.1	157.1	0.0	157.1
5	47.8	28.8	60.1	144.5	9.0	135.5
6	93.2	32.6	35.0	162.4	0.0	162.4
7	178.8	66.6	37.2	329.4	82.2	247.2
8	223.2	71.6	32.1	419.0	84.9	334.1
9	132.5	54.7	41.3	251.6	51.0	200.6
10	28.2	24.8	87.9	92.3	0.0	92.3
11	0.7	4.3	577.6	26.9	0.0	26.9
12	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	724.2	181.5	25.1	1037.4	0.0	1037.4

APPENDIX II - Program for the Computation of Initial and Conditional Probabilities

APPENDICE II - Programme pour l'estimation des probabilites initiates et conditionnelles

Program for the computation of initial and conditional probabilities/
Programme pour l'estimation des probabilités initiales et conditionnelles

```
1 SUB CCONW
2  DIM #10%, D8$(1%),D9(1%),P(100%,53%),B(100%,13%),C(100%,36%), &
     R8(103%,37%),R1(103%,37%)
10 L$='  ##  ###  ###  ###  ###  ###  ###  ###  ###  ###  ###  ###  ###  ###  ###  ###  ###  ###.#'
80 ONERROR GOTO 30000
110 DIM W1%(52%),W2%(52%),W3%(52%),M(52%)
111 DIM A(52%),AC(52%),C1(52%)
112 DIM E4(52%),V(5%),U(5%),X(5%)
120 DIM E1(53%,5%),E2(52%,5%),E3(52%,5%)
121 DIM VI(52%)
131 K9%=1
140 W%=1
145 PRINT #6%
150  X=K9%*10
160 MAT W1%=ZER \ MAT W2%=ZER \ MAT W3%=ZER \ MAT M=ZER
165 N%=D9(1%)
170 FOR I% = 1 TO N%
180 FOR J%=1% TO 36%
185 M(J%)=M(J%)+C(I%,J%)
190 IF C(I%,J%) > X THEN W1%(J%)=W1%(J%)+1% \ W1%=1%
195 FOR K%=1% TO W%
200 K1%=J%+K% \ I1%=I%
205 IF K1%>36% THEN K1%=K1% -36% \ I1%=I1%+1%
210 IF I1%>N% THEN 232
215 IF C(I1%,K1%)<=X THEN 232
220 NEXT K%
225 W3%(J%)=W3%(J%)+1%
230 IF W1% THEN W2%(J%)=W2%(J%)+1%
232 W1%=0%
235 NEXT J%
237 NEXT I%
245 N=N%
250 FOR J%=1% TO 36%
255 P1=W1%(J%)/N \ P2=1.- P1
260 IF P1>0 THEN C1=W2%(J%)*1./W1%(J%) ELSE C1=0.  ! P(W/W)
265 IF P1>0. THEN C2=1.- C1 ELSE C2=0.  ! P(D/W)
270 IF W1%(J%)<>N% THEN C3=(W3%(J%)- W2%(J%))/(N - W1%(J%)) ELSE C3=0.  ! P(W/D)
275 IF W1%(J%)<>N% THEN C4=1.- C3 ELSE C4=0.  ! P(D/D)
```

```
280 M=M(J%)/N  ! MEAN FOR WEEK J%
285 E1(J%,K9%)=P1*100 \ E2(J%,K9%)=C1*100 \ E3(J%,K9%)=C3*100
286 IF K9%=1 THEN E4(J%)=M
293 NEXT J%
294 K9%=K9%+1
295 IF K9%<=5 THEN GOTO 140 ELSE 300
300 F1=0
301 F2=0
302 T=0
306 I2%,I3%=1
307 E1(37%,1%)=0
310 FOR I%=1 TO 36
311 T=T+E4(I%)
312 VI(I%)=E1(I%,1%)
315 A(I%)=0 \ AC(I%)=0 \ C1(I%)=0 \ NEXT I%
318 F1,F2,F3,F4=0
320 FOR I%=1 TO 35
321 IF F1=1 THEN GOTO 325
322 IF VI(I%)>45 AND VI(I%+1%)>45 THEN F1=1 \ FF1=I%
324 GOTO 326
325 IF VI(I%)<45 THEN FF2=I%-1% \ GOTO 327
326 NEXT I%
327 FC1=0 \ FOR I%=FF2 TO 35
328 IF FC1=1 THEN GOTO 335
329 IF VI(I%)>45 AND VI(I%+1%)>45 THEN FC1=1 \ FC2=I%
330 GOTO 336
335 IF VI(I%)<45 THEN FC3=I%-1% \ GOTO 340
336 NEXT I%
340 FC4=FC3-FC2 \ FC5=FF2-FF1
341 IF FC4>FC5 THEN FF1=FC2 \ FF2=FC3
377 FOR I%=1 TO FF1
378 II1%=(FF1-I%)+1%
380 IF VI(II1%)<15 THEN FF3=II1%+1% \ GOTO 385
381 NEXT I%
385 FOR I%=FF2 TO 36
386 IF VI(I%)<15 THEN FF4=I%-1% \ GOTO 390
387 NEXT I%
390 FOR I%=FF3 TO FF1-1 \ A(I%)=I% \ NEXT I%
392 FOR I%=FF1 TO FF2 \ AC(I%)=I% \ NEXT I%
394 FOR I%=FF2+1 TO FF4 \ C1(I%)=I% \ NEXT I%
401  T%=T*10+.5 \ T=T% \ T=T/10
402 B1=0 \ B2=0 \ B3=0
```

```
403 GOSUB 2000
405 FOR I%=1 TO 36
410 A1%=A(I%) \ A2%=AC(I%)  \ A3%=C1(I%)
415 IF A1%>0 THEN B1=B1+E4(A1%)
420 IF A2%>0 THEN B2=B2+E4(A2%)
430 IF A3%>0 THEN B3=B3+E4(A3%)
440 NEXT I%
441  B1%=B1*10+.5 \ B1=B1% \ B1=B1/10
442 B2%=B2*10+.5 \ B2=B2% \ B2=B2/10
443 B3%=B3*10+.5 \ B3=B3% \ B3=B3/10
444 PRINT #6%
500 L%=1\PRINT #6%,'Prerainy/Pre-pluvieuse (';B1;'mm)'
501 PRINT #6%
520 FOR I%=1 TO 36
530 A1%=A(I%)
540 IF A1%<=0 THEN 600
550 FOR J%=1 TO 5
560 V(J%)=E1(A1%,J%) \ U(J%)=E2(A1%,J%) \ X(J%)=E3(A1%,J%)
561 NEXT J%
562 GOSUB 1400
600 NEXT I%
601 L%=1\PRINT #6% \ PRINT #6%,'Rainy/Pluvieuse (';B2;'mm)'
602 PRINT #6%
610 FOR I%=1 TO 36
620 A1%=AC(I%)
630 IF A1%<=0 THEN 690
640 FOR J%=1 TO 5
650 V(J%)=E1(A1%,J%) \ U(J%)=E2(A1%,J%) \ X(J%)=E3(A1%,J%)
655 NEXT J%
660 GOSUB 1400
662 IF AC(I%+1%)<=0 THEN GOTO 690
665 IF L%/4%*4%-L%=0 THEN PRINT #6%
666 L%=L%+1%
690 NEXT I%
700 PRINT #6% \ PRINT #6%,'Postrainy/Post-pluvieuse (';B3;'mm)'
701 PRINT #6%
710 FOR I%=1 TO 36
720 A1%=C1(I%)
730 IF A1%<=0 THEN 750
735 FOR J%=1 TO 5
736 V(J%)=E1(A1%,J%) \ U(J%)=E2(A1%,J%) \ X(J%)=E3(A1%,J%)
740 NEXT J%
```

```
745 GOSUB 1400
750 NEXT I%
770 PRINT#6%,'-------------------------------------------------------------------'
800 PRINT #6%
810 PRINT #6%,' W = WET          D = DRY'
820 PRINT #6%,' H = HUMIDE       S = SEC'
955 PRINT #6%, CHR$(12)
1000GOTO 32766
1400 V1%=V(1%)+.5 \ V2%=V(2%)+.5 \ V3%=V(3%)+.5 \ V4%=V(4%)+.5 \ V5%=V(5%)+.5
1419 U1%=U(1%)+.5 \ U2%=U(2%)+.5 \ U3%=U(3%)+.5 \ U4%=U(4%)+.5 \ U5%=U(5%)+.5
1420 X1%=X(1%)+.5 \ X2%=X(2%)+.5 \ X3%=X(3%)+.5 \ X4%=X(4%)+.5 \ X5%=X(5%)+.5
1500 PRINT #6% USING L$, A1%,V1%,U1%,X1%,V2%,U2%,X2%,V3%,U3%,X3%,V4%,U4%, X4%,V5%, U5%,X5%,E4(A1%)
1550 RETURN
2000!
2001 PRINT#6%,'STATION :  ';D8$(1%);' (';
2002 CD$="#####.#"
2005 PRINT #6% USING CD$,T;
2006 PRINT #6%,'mm)';TAB(64);'DATA BASE       : ';N%;' YEARS'
2007 PRINT #6%,TAB(64);'BASE DE DONNEES : ';N%;' ANS'
2410 PRINT#6%,'-------------------------------------------------------------------'
2415 PRINT#6%,'                >10 mm        >20 mm        >30 mm        >40 mm        >50 mm        MEAN/'
2420 PRINT#6%,'DECADE     ------------  ------------  ------------  ------------  ------------  MOYENNE'
2430 PRINT#6%,'            W  W/W  W/D   W  W/W  W/D   W  W/W  W/D   W  W/W W/D   W  W/W  W/D    '
2435 PRINT#6%,'            H  H/H  H/S   H  H/H  H/S   H  H/H  H/S   H  H/H H/S   H  H/H  H/S   (mm)'
2440 PRINT#6%,'-------------------------------------------------------------------------------------'
3000 RETURN
30000  !ERROR PROCESSING
30010 PRINT ERR,ERL
30020 PRINT ERT$(ERR)
32766 SUBEND
```

APPENDIX III - Results of the Initial and Conditional Probability Analysis

APPENDICE III - Resultats de l'analyse des probabilites initiates et conditionnelles

B a m (642 mm)

Decade	>10 mm			>20 mm			>30 mm			>40 mm			>50 mm			Mean/ Moyenne (mm)
	W H	W-W H+H	W-D H+S	W H	W-W H+H	W-D H+S	W H	W-W H+H	W-D H+S	W H	W-W H+H	W-D H+S	W H	W-W H+H	W-D H+S	
Prerainy/Pre-pluvieuse (15.4 mm)																
13	32	50	23	5	0	14	5	0	3	3	0	0	0	0	0	7.6
14	32	58	73	13	20	52	3	0	27	0	0	16	0	0	5	7.8
Rainy/Pluvieuse (585.2 mm)																
15	68	77	25	47	56	25	26	40	11	16	33	6	5	0	8	21.6
16	61	91	80	39	67	74	18	57	35	11	0	26	8	0	14	21.3
17	87	100	80	71	81	64	39	73	48	24	56	28	13	60	27	30.6
18	97	89	100	76	69	89	58	55	75	34	23	68	32	17	46	40.8
19	89	82	75	74	75	80	63	71	71	53	55	50	37	43	42	39.6
20	82	97	86	76	93	78	71	78	73	53	75	56	42	56	59	46.4
21	95	97	100	89	91	100	76	86	78	66	84	62	58	64	63	67.8
22	97	100	100	92	94	100	84	88	100	76	72	78	63	67	50	71.5
23	100	95	0	95	92	100	89	88	100	74	82	80	61	78	67	67.2
24	95	86	100	92	74	100	89	56	50	82	39	57	74	39	20	75.0
25	87	73	80	76	69	67	55	57	59	42	31	45	34	8	40	44.7
26	74	79	40	68	50	42	58	18	31	39	7	17	29	9	4	38.9
27	68	35	42	47	28	15	24	11	14	13	0	6	5	0	3	20.0
Postrainy/Post-pluvieuse (21.1 mm)																
28	37	29	13	21	13	7	13	0	3	5	0	3	3	0	3	11.6
29	18	43	13	8	0	3	3	0	3	3	0	0	3	0	0	4.9
30	18	0	3	3	0	0	3	0	0	0	0	0	0	0	0	4.6

W = Wet; W-W = Wet followed by wet; W-D = Wet followed by dry.
H = Humide; H+H = Humide suivi par humide; H+S = Humide suivi par sec.

Banfora (1132.1 mm)

Decade	>10 mm			>20 mm			>30 mm			>40 mm			>50 mm			Mean/ Moyenne (mm)
	W H	W-W H+H	W+D H+S	W H	W-W H+H	W+D H+S	W H	W-W H+H	W+D H+S	W H	W-W H+H	W+D H+S	W H	W-W H+H	W+D H+S	
Prerainy/ Pre-pluvieuse (15.2 mm)																
8	17	36	34	9	0	17	5	0	13	3	0	5	0	0	3	5.1
9	34	50	45	16	20	33	13	13	13	5	0	5	3	0	0	10.1
Rainy/Pluvieuse (1083.5 mm)																
10	47	57	50	31	45	43	13	13	32	5	0	20	0	0	11	12.8
11	53	74	63	44	54	44	30	37	33	19	33	23	11	29	14	21.9
12	69	66	70	48	65	58	34	64	45	25	50	31	16	20	19	26.8
13	67	70	76	61	62	52	52	45	35	36	26	29	19	17	13	32.1
14	72	89	78	58	76	67	41	77	50	28	78	43	14	56	42	28.1
15	86	91	78	72	83	83	61	64	52	53	53	43	44	36	33	48.6
16	89	96	71	83	83	64	59	74	69	48	61	58	34	55	31	42.6
17	94	93	75	80	75	69	72	59	67	59	58	46	39	48	38	49.8
18	92	98	60	73	91	71	61	82	64	53	59	63	42	48	41	46.0
19	95	97	67	86	95	89	75	90	81	61	82	72	44	61	67	53.3
20	95	100	67	94	93	75	88	91	75	78	80	79	64	73	74	70.4
21	98	97	0	92	93	60	89	86	71	80	80	77	73	66	71	81.3
22	95	98	33	91	98	67	84	89	80	80	86	69	67	88	67	93.8
23	95	98	33	95	97	33	88	93	63	83	91	73	81	83	75	96.2
24	95	100	67	94	98	75	89	93	71	88	88	63	81	88	50	105.5
25	98	98	0	97	90	50	91	83	67	84	76	60	81	63	42	81.9
26	97	94	50	89	89	43	81	85	50	73	72	53	59	53	42	64.3
27	92	85	80	84	63	70	78	52	43	67	37	29	48	35	15	56.5
28	84	52	40	64	44	22	50	25	16	34	18	12	25	13	8	36.5
29	50	53	47	36	48	32	20	8	25	14	0	11	9	0	7	18.0
30	50	22	31	38	13	20	22	14	10	9	17	7	6	0	2	17.0
Postrainy/Post-pluvieuse (16.3 mm)																
31	27	18	19	17	27	9	11	14	9	8	0	5	2	0	5	9.2
32	19	25	6	13	0	4	9	0	0	5	0	0	5	0	0	7.2

W = Wet; W-W = Wet followed by wet; W+D = Wet followed by dry.
H = Humide; H+H = Humide suivi par humide; H+S = Humide suivi par sec.

Batie (1162.3 mm)

Decade	>10 mm			>20 mm			>30 mm			>40 mm			>50 mm			Mean/ Moyenne (mm)
	W H	W#W H+H	W+D H+S	W H	W#W H+H	W+D H+S	W H	W#W H+H	W+D H+S	W H	W#W H+H	W+D H+S	W H	W#W H+H	W+D H+S	
Prerainy/Pre-pluvieuse (28.2 ram)																
5	19	43	10	11	25	6	5	0	9	3	0	6	3	0	6	5.6
6	16	17	23	8	0	6	8	0	6	5	0	3	5	0	0	5.9
7	22	25	41	5	0	29	5	0	20	3	0	6	0	0	3	5.2
8	38	79	52	27	70	41	19	57	27	5	50	20	3	0	14	11,5
Rainy/Pluvieuse (1103 ram)																
9	62	65	36	49	22	32	32	25	20	22	25	14	14	0	6	23.9
10	54	65	59	27	70	56	22	38	41	16	33	29	5	0	26	17.5
11	62	91	64	59	64	60	41	40	64	30	18	38	24	0	29	27.7
12	81	83	86	62	65	86	54	35	65	32	33	36	22	38	17	34.3
13	84	97	83	73	85	60	49	72	58	35	46	50	22	25	41	36.2
14	95	91	50	78	69	75	65	67	54	49	61	47	38	43	43	46.9
15	89	94	50	70	81	73	62	57	71	54	45	47	43	31	29	42.8
16	89	85	75	78	76	88	62	61	71	46	47	60	30	18	50	40.6
17	84	90	83	78	79	88	65	67	69	54	60	53	41	47	36	49.5
18	89	85	100	81	80	71	68	60	58	57	57	38	41	67	23	47.7
19	86	91	100	78	79	88	59	64	60	49	61	53	41	53	41	48.0
20	92	91	100	81	73	100	62	65	71	57	57	63	46	47	50	54.9
21	92	97	100	78	79	88	68	76	67	59	64	67	49	67	53	61.9
22	97	92	100	81	80	100	73	78	90	65	67	77	59	73	47	66.2
23	92	100	100	84	97	100	81	90	100	70	81	73	62	74	71	65.4
24	100	97	0	97	97	100	92	97	100	78	97	88	73	89	80	85.4
25	97	100	100	97	97	100	97	89	100	95	86	50	86	75	60	100.5
26	100	100	0	97	94	0	89	82	25	84	71	50	73	67	20	82.4
27	100	86	0	92	85	67	76	68	33	68	64	33	54	50	29	61.2
28	86	66	80	84	48	50	59	45	27	54	35	18	41	33	14	46.6
29	68	56	42	49	44	32	38	43	30	27	40	22	22	38	17	35.0
30	51	47	33	38	29	17	35	8	8	27	10	4	22	13	0	28.4
Postrainy/Post-pluvieuse (15.9 mm)																
31	41	20	14	22	25	7	8	33	6	5	0	6	3	0	0	10.9
32	16	17	0	11	25	0	8	0	0	5	0	0	0	0	0	5.0

W = Wet; W#W = Wet followed by wet; W+D = Wet followed by dry.
H = Humide; H+H = Humide suivi par humide; H+S = Humide suivi par sec.

Bobo-Dioulasso (1064 mm)

Decade	>10 mm			>20 mm			>30 mm			>40 mm			>50 mm			Mean/ Moyenne (mm)
	W H	W-W H+H	W+D H+S	W H	W-W H+H	W+D H+S	W H	W-W H+H	W+D H+S	W H	W-W H+H	W+D H+S	W H	W-W H+H	W+D H+S	
Prerainy/Pre-pluvieuse (17.7 mm)																
9	30	26	26	16	17	17	8	0	9	7	0	3	3	0	0	9.9
10	26	55	46	17	8	32	8	0	21	3	0	9	0	0	5	7.8
Rainy/Pluvieuse (1001.9 mm)																
11	49	57	56	28	52	40	20	40	28	9	0	17	5	0	13	15.3
12	57	63	67	43	45	51	30	26	42	16	25	20	12	22	15	22.6
13	64	73	70	49	62	49	37	39	35	21	25	23	16	17	16	29.4
14	72	84	86	55	71	79	37	64	65	24	44	57	16	33	41	28.5
15	84	88	75	75	72	53	64	55	44	54	51	34	39	40	24	47.6
16	86	92	64	67	84	72	51	72	62	43	55	44	30	39	40	37.6
17	88	93	67	80	85	73	67	67	60	49	35	62	39	30	46	44.1
18	89	96	75	83	89	85	64	71	85	49	59	72	39	47	54	43.9
19	93	97	20	88	93	44	76	90	61	66	84	58	51	74	57	55.4
20	92	99	50	87	94	60	83	89	54	75	86	58	66	76	58	72.0
21	95	97	25	89	96	63	83	89	77	79	83	75	70	83	70	79.9
22	93	100	0	92	97	17	87	95	50	82	90	57	79	88	56	84.4
23	93	99	20	91	99	43	89	93	50	84	91	58	82	85	64	97.3
24	93	97	60	93	97	60	88	93	78	86	83	64	82	74	57	102.8
25	95	99	0	95	97	0	91	91	29	80	75	47	71	65	50	82.0
26	93	97	40	92	81	33	86	62	45	70	45	26	61	35	27	66.7
27	93	73	40	78	54	53	59	38	32	39	27	22	32	17	19	44.0
28	71	72	41	54	44	37	36	30	22	24	22	17	18	21	10	27.7
29	63	54	25	41	26	29	25	32	19	18	14	15	12	11	13	20.8
Postrainy/Post-pluvieuse (24.3 mm)																
30	43	18	19	28	5	13	22	6	5	14	9	5	13	10	2	17.3
31	18	0	11	11	0	4	5	0	3	5	0	1	3	0	0	6.9

W = Wet; W+W = Wet followed by wet; W+D = Wet followed by dry.
H = Humide; H+H = Humide suivi par humide; H+S = Humide suivi par sec.

Bogande (631.9 mm)

Decade	>10 mm			>20 mm			>30 mm			>40 mm			>50 mm			Mean/ Moyenne (mm)
	W H	WAW H+H	W+D H+S	W H	w+w H+H	W+D H+S	W H	WAW H+H	W+D H+S	W H	WAW H+H	W+D H+S	W H	WAW H+H	W+D H+S	
Prerainy/Pre-pluvieuse (25.3 mm)																
13	37	46	36	20	29	29	14	20	20	9	0	16	3	0	6	11.1
14	40	43	67	29	30	52	20	0	43	14	0	33	6	0	18	14.2
Rainy/Pluvieuse (564.4 mm)																
15	57	50	67	46	38	47	34	33	26	29	10	16	17	0	7	29.4
16	57	85	67	43	33	45	29	40	36	14	0	27	6	0	18	20.1
17	77	93	75	40	64	76	37	54	55	23	50	41	17	33	41	26.8
18	89	87	75	71	76	60	54	74	63	43	53	40	40	29	29	35.6
19	86	93	80	71	76	90	69	67	82	46	63	58	29	50	44	37.0
20	91	100	33	80	89	71	71	88	60	60	86	43	46	81	42	48.8
21	94	97	50	86	90	80	80	82	86	69	58	64	60	38	64	65.0
22	94	94	50	89	87	50	83	79	50	60	71	50	49	76	39	56.5
23	91	94	67	83	79	83	74	77	89	63	64	69	57	50	67	66.4
24	91	94	67	80	86	86	80	68	57	66	61	50	57	55	40	65.1
25	91	81	67	86	57	60	66	57	42	57	35	40	49	24	28	53.2
26	80	71	43	57	35	33	51	39	29	37	23	27	26	11	19	36.0
27	66	35	17	34	33	13	34	25	13	26	0	8	17	0	7	24.4
Postrainy/Post-pluvieuse (18.3 mm)																
28	29	30	16	20	14	14	17	17	10	6	0	0	6	0	0	11.1
29	20	29	11	14	40	3	11	50	3	0	0	3	0	0	3	7.2

W = Wet; WAW = Wet followed by wet; W+D = Wet followed by dry.
H = Humide; H+H = Humide suivi par humide; H+S - Humide suivi par sec.

Boromo (948.4 mm)

Decade	>10 mm			>20 mm			>30 mm			>40 mm			>50 mm			Mean/ Moyenne (mm)
	W H	W+W H+H	W+D H+S	W H	W+W H+H	W+D H+S	W H	W+W H+H	W+D H+S	W H	W+W H+H	W+D H+S	W H	W+W H+H	W+D H+S	
Prerainy/Pre-pluvieuse (15.3 mm)																
10	18	9	32	7	0	18	3	0	12	2	0	10	0	0	2	5.8
11	28	29	55	16	10	31	11	14	24	10	0	15	2	0	10	9.5
Rainy/Pluvieuse (901.4 ram)																
12	48	59	69	*28*	35	50	23	14	34	13	13	25	10	17	11	17.1
13	64	74	73	46	54	61	30	22	37	23	14	23	11	14	11	23.3
14	74	80	75	57	77	58	33	70	46	21	38	42	11	43	26	27.6
15	79	88	85	69	79	58	54	52	50	41	44	33	28	29	27	37.9
16	87	89	88	72	70	65	51	68	47	38	39	45	28	41	27	35.5
17	89	93	86	69	79	79	57	57	65	43	46	46	31	42	24	40.4
18	92	95	60	79	90	69	61	76	58	46	61	61	30	33	47	43.1
19	92	96	80	85	90	89	69	88	79	61	76	71	43	62	60	52.7
20	95	98	67	90	93	83	85	90	78	74	76	81	61	78	67	72.1
21	97	100	50	92	100	80	89	91	86	77	81	79	74	71	69	70.9
22	98	100	0	98	95	0	90	87	83	80	80	75	70	72	67	80.2
23	98	100	0	93	100	75	87	96	75	79	96	85	70	91	83	89.5
24	98	100	0	98	100	0	93	89	50	93	86	50	89	72	71	98.5
25	98	97	0	98	90	0	87	72	75	84	67	50	72	57	35	74.9
26	95	81	67	89	63	57	72	59	53	64	44	55	51	29	40	58.6
27	80	63	58	62	47	43	57	26	35	48	17	19	34	24	10	41.7
28	62	53	43	46	43	21	30	17	16	18	9	6	15	0	2	23.0
29	49	47	13	31	42	14	16	10	14	7	0	7	2	0	3	14.4
Postrainy/Post-pluvieuse (10.2 mm)																
30	30	17	12	23	14	4	13	13	6	7	0	7	3	0	3	10.2

W = Wet; W+W = Wet followed by wet; W+D = Wet followed by dry.
H = Humide; H+H = Humide suivi par humide; H+S = Humide suivi par sec.

Dedougou (907.7 mm)

Decade	>10 mm			>20 mm			>30 mm			>40 mm			>50 mm			Mean/ Moyenne (mm)
	W H	W-W H+H	W+D H+S	W H	W-W H+H	W-K) H+S	W H	W+W H+H	W-K) H+S	W H	W+W H+H	W+D H+S	W H	W-W H+H	W-K) H+S	
Prerainy/Pre-pluvieuse (22.8 mm)																
11	19	42	37	13	38	22	10	50	16	8	20	9	5	33	5	8.5
12	38	58	49	24	40	38	19	25	25	10	17	16	6	25	8	14.3
Rainy/Pluvieuse (860 mm)																
13	52	42	50	38	29	28	25	13	19	16	0	8	10	0	4	20.1
14	46	83	74	29	67	53	17	55	38	6	75	31	3	100	21	15.0
15	78	92	57	57	69	56	41	46	46	33	43	26	24	33	21	33.3
16	84	87	70	63	70	57	46	62	53	32	45	49	24	20	33	32.5
17	84	96	90	65	85	82	57	56	67	48	40	48	30	32	36	41.1
18	95	97	67	84	91	80	60	74	84	44	54	69	35	45	59	42.7
19	95	98	67	89	88	86	78	80	64	62	72	58	54	59	52	59.2
20	97	98	100	87	96	100	76	90	93	67	90	81	56	83	71	62.2
21	98	100	100	97	100	100	90	88	100	87	87	88	78	78	79	88.5
22	100	98	0	100	98	0	89	91	86	87	84	75	78	76	79	82.7
23	98	100	100	98	97	100	90	89	100	83	81	100	76	75	93	96.7
24	100	98	0	97	90	100	90	79	100	84	72	60	79	64	46	86.2
25	98	92	100	90	82	83	81	73	50	70	61	58	60	42	56	67.8
26	92	76	80	83	54	82	68	49	50	60	39	40	48	37	33	54.5
27	76	69	73	59	57	38	49	32	25	40	28	16	35	23	15	36.8
28	70	59	47	49	29	25	29	22	11	21	15	6	17	0	6	25.2
29	56	34	11	27	18	15	14	22	7	8	40	7	5	0	5	15.5
Postrainy/Post-pluvieuse (9.1 mm)																
30	24	0	6	16	0	4	10	0	2	10	0	2	5	0	2	9.1

W = Wet; W-W = Wet followed by wet; W+D = Wet followed by dry.
H = Humide; H+H = Humide suivi par humide; H+S = Humide suivi par sec.

Diapaga (844.5 mm)

Decade	>10 mm			>20 mm			>30 mm			>40 mm			>50 mm			Mean/ Moyenne (mm)
	W H	W+W H+H	W+D H+S	W H	W+W H+H	W+D H+S	W H	W+W H+H	W+D H+S	W H	W+W H+H	W+D H+S	W H	W+W H+H	W+D H+S	
Prerainy/Pre-pluvieuse (9.4 mm)																
11	24	62	51	17	22	24	13	14	13	6	0	6	4	0	4	9.4
Rainy / Pluvieuse (789.1 mm)																
12	54	55	56	24	46	41	13	57	32	6	67	20	4	50	13	13.5
13	56	53	58	43	48	39	35	26	26	22	25	17	15	0	11	22.7
14	56	87	88	43	78	68	26	64	68	19	30	39	9	20	22	20.6
15	87	94	71	72	79	60	67	58	61	37	30	47	22	25	31	38.6
16	91	90	100	74	70	86	59	50	55	41	36	38	30	19	21	38.1
17	91	82	100	74	70	79	52	64	62	37	50	56	20	45	40	34.5
18	83	91	78	72	79	80	63	56	70	54	45	60	41	27	38	42.8
19	89	96	83	80	84	82	61	79	81	52	64	69	33	28	72	45.6
20	94	92	100	83	89	89	80	84	73	67	69	72	57	55	70	57.8
21	93	94	100	89	88	100	81	84	90	70	74	81	61	64	81	69.3
22	94	100	100	89	100	100	85	93	100	76	85	92	70	74	88	76.6
23	100	100	0	100	96	0	94	92	100	87	94	71	78	79	75	85.7
24	100	100	0	96	98	100	93	90	100	91	80	100	78	62	100	84.5
25	100	100	0	98	89	100	91	73	80	81	61	90	70	45	50	71.4
26	100	74	0	89	56	50	74	40	57	67	28	50	46	12	21	55.1
27	74	45	43	56	30	21	44	17	20	35	11	11	17	11	4	32.1
Postrainy/Post-pluvieuse (30.7 mm)																
28	44	25	20	26	7	13	19	10	9	11	0	0	6	0	0	13.9
29	22	33	26	11	33	19	9	40	12	0	0	11	0	0	4	7.0
30	28	27	8	20	18	5	15	0	2	11	0	0	4	0	0	9.8

W = Wet; W+W = Wet followed by wet; W+D = Wet followed by dry.
H = Humide; H+H = Humide suivi par humide; H+S = Humide suivi par sec.

Diebougou (1042.5 mm)

Decade	>10 mm			>20 mm			>30 mm			>40 mm			>50 mm			Mean/ Moyenne (mm)
	W H	W+W H+H	W-H) H+S	W H	w+w H+H	W+D H+S	W H	W+W H+H	W+D H+S	W H	W+W H+H	W+D H+S	W H	W+W H+H	W-H) H+S	
Prerainy/Pre-pluvieuse (39.8 mm)																
8	16	40	31	8	20	18	5	0	14	5	0	9	3	0	2	6.2
9	33	20	29	18	0	16	13	0	9	8	0	7	2	0	3	10.4
10	26	38	42	13	38	28	8	20	16	7	0	12	3	0	5	8.3
11	41	68	67	30	50	44	16	40	29	11	29	26	5	0	21	15.0
Rainy/Pluvieuse (966.3 mm)																
12	67	66	55	46	50	45	31	47	24	26	25	16	20	25	6	26.8
13	62	76	74	48	69	50	31	47	40	18	27	32	10	17	25	25.0
14	75	87	87	59	81	76	43	62	57	31	42	48	25	33	41	37.8
15	87	89	100	79	75	85	59	56	64	46	46	45	39	38	41	44.0
16	90	96	100	77	83	86	59	69	72	46	50	52	39	46	41	44.9
17	97	98	100	84	88	80	70	77	67	51	65	60	43	46	46	50.7
18	98	90	100	87	75	100	74	60	75	62	50	52	46	39	39	55.2
19	90	98	83	79	96	92	64	90	82	51	84	70	39	63	65	47.3
20	97	97	100	95	93	100	87	83	88	77	77	79	64	67	59	71.4
21	97	98	50	93	93	75	84	88	80	77	79	71	64	67	77	65.6
22	97	97	50	92	96	80	87	91	88	77	85	86	70	79	78	81.0
23	95	100	67	95	98	33	90	91	67	85	85	67	79	83	62	80.8
24	98	95	0	95	93	67	89	91	71	82	88	55	79	83	54	92.4
25	93	98	25	92	93	40	89	85	57	82	72	73	77	68	57	83.7
26	93	91	25	89	76	29	82	64	45	72	50	29	66	40	33	70.2
27	87	77	63	70	47	50	61	38	38	44	33	35	38	26	16	41.4
28	75	59	27	48	52	28	38	39	21	34	19	3	20	17	4	30.3
29	51	52	27	39	38	11	28	18	9	8	20	7	7	25	4	17.7
Postrainy/Post-pluvieuse (21.6 mm)																
30	39	29	22	21	8	17	11	0	6	8	0	4	5	0	2	14.3
31	25	20	4	15	22	0	5	67	0	3	100	0	2	100	2	7.3

W = Wet; W+W = Wet followed by wet; W-K) = Wet followed by dry.
H = Humide; H+H = Humide suivi par humide; H+S = Humide suivi par sec.

Djibo (507.9 mm)

Decade	>10 mm			>20 mm			>30 mm			>40 mm			>50 mm			Mean/ Moyenne (mm)
	W H	W+W H+H	W+D H+S	W H	W+W H+H	W+D H+S	W H	w+w H+H	W-K) H+S	W H	W+W H+H	W-K) H+S	W H	w+w H+H	W+D H+S	
Prerainy/Pre-pluvieuse (28.8 mm)																
14	25	0	42	6	0	23	6	0	17	3	0	10	0	0	0	6.3
15	31	50	41	22	29	20	16	20	7	9	0	3	0	0	3	10.7
16	44	64	50	22	29	20	9	0	10	3	0	10	3	0	3	11.8
Rainy/Pluvieuse (424.9 mm)																
17	56	61	71	22	57	44	9	67	34	9	67	31	3	0	26	14.8
18	66	71	73	47	60	59	38	25	50	34	18	33	25	13	21	30.3
19	72	91	78	59	79	62	41	77	53	28	56	57	19	50	42	28.0
20	88	100	50	72	83	44	63	75	50	56	50	43	44	43	28	48.4
21	94	97	100	72	96	100	66	81	91	47	53	76	34	45	57	48.2
22	97	97	0	97	94	0	84	78	40	66	67	27	53	47	33	55.6
23	94	100	100	91	90	67	72	74	89	53	59	67	41	62	42	54.7
24	100	84	0	88	64	75	78	64	43	63	40	42	50	25	31	71.1
25	84	85	60	66	71	27	59	63	31	41	69	21	28	44	17	39.1
26	81	42	50	56	*28*	29	50	19	13	41	15	11	25	13	4	34.7
Postrainy/Post-pluvieuse (37 mm)																
27	44	21	39	28	22	26	16	20	15	13	25	11	6	50	7	14.1
28	31	40	27	25	25	21	16	20	11	13	0	7	9	0	3	12.6
29	31	20	5	22	14	0	13	0	0	6	0	0	3	0	0	10.3

W = Wet; W+W = Wet followed by wet; W+D = Wet followed by dry.
H = Humide; H+H = Humide suivi par humide; H+S = Humide suivi par sec.

Dori (497.8 mm)

Decade	>10 mm			>20 mm			>30 mm			>40 mm			>50 mm			Mean/ Moyenne (mm)
	W H	W+W H+H	W+D H+S	W H	W+W H+H	W+D H+S	W H	W+W H+H	W+D H+S	W H	W+W H+H	W+D H+S	W H	W+W H+H	W+D H+S	
Prerainy / Pre-pluvieuse (34.2 mm)																
14	34	50	33	14	33	18	5	0	10	2	0	8	2	0	5	8.4
15	38	60	35	20	31	27	9	0	14	8	0	8	5	0	3	11.7
16	45	79	47	28	39	38	12	25	19	8	40	8	3	50	6	14.1
Rainy / Pluvieuse (435.4 mm)																
17	62	75	68	38	60	58	20	46	35	11	29	21	8	20	13	19.1
18	72	83	89	58	76	59	37	67	54	22	50	41	14	44	23	28.4
19	85	89	40	69	78	55	58	71	44	43	57	43	26	35	27	36.2
20	82	98	83	71	91	74	60	79	77	49	69	55	29	32	52	38.7
21	95	89	67	86	82	89	78	67	71	62	65	56	46	60	46	56.1
22	88	98	50	83	94	45	68	91	57	62	75	52	52	62	48	53.5
23	92	95	60	86	91	67	80	77	54	66	63	64	55	50	48	58.9
24	92	78	60	88	65	50	72	49	33	63	46	21	49	28	12	59.8
25	77	74	40	63	54	42	45	48	33	37	38	24	20	23	17	32.2
26	66	56	45	49	38	42	40	19	31	29	21	15	18	25	13	30.1
27	52	21	19	40	15	8	26	0	6	17	0	4	15	0	2	22.3
Postrainy / Post-pluvieuse (16.3 mm)																
28	20	0	23	11	0	10	5	0	5	3	0	3	2	0	3	6.5
29	18	50	9	9	33	5	5	33	2	3	0	2	3	0	2	5.4
30	17	9	2	8	0	0	3	0	0	2	0	0	2	0	0	4.4

W = Wet; W+W = Wet followed by wet; W+K) = Wet followed by dry.
H = Humide; H+H = Humide suivi par humide; H+S = Humide suivi par sec.

Fada N'Gourma (853.7 mm)

Decade	>10 mm			>20 mm			>30 mm			>40 mm			>50 mm			Mean/ Moyenne (mm)
	W H	W-W H+H	W-D H+S	W H	W-W H+H	W-D H+S	W H	W-W H+H	W-D H+S	W H	W-W H+H	W-D H+S	W H	W-W H+H	W-D H+S	
Prerainy/Pre-pluvieuse (16.9 mm)																
9	15	30	16	6	25	6	5	0	5	3	0	3	2	0	2	5.3
10	18	25	20	8	0	8	5	0	3	3	0	2	2	0	0	5.7
11	21	50	44	8	20	23	3	0	9	2	0	8	0	0	5	5.9
Rainy/Pluvieuse (814.8 mm)																
12	45	50	69	23	33	43	9	17	22	8	0	15	5	0	10	13.2
13	61	58	73	41	26	51	21	14	38	14	11	26	9	0	18	19.7
14	64	83	75	41	70	69	33	41	52	24	13	38	17	0	24	25.2
15	80	89	92	70	67	70	48	50	44	32	48	33	20	38	19	34.2
16	89	97	86	68	82	86	47	65	66	38	52	56	23	40	43	35.7
17	95	94	67	83	78	64	65	70	57	55	56	40	42	36	26	46.0
18	92	93	80	76	84	75	65	63	57	48	44	44	30	15	43	41.1
19	92	93	80	82	85	75	61	83	77	44	62	70	35	43	67	46.8
20	92	100	80	83	93	91	80	79	85	67	70	73	59	64	67	61.5
21	98	98	100	92	92	60	80	87	85	71	81	74	65	70	70	71.8
22	98	100	100	89	100	100	86	91	100	79	87	86	70	83	70	79.3
23	100	98	0	100	97	0	92	92	100	86	84	89	79	75	79	90.7
24	98	97	100	97	94	100	92	90	60	85	79	70	76	72	56	79.1
25	97	94	0	94	82	50	88	74	50	77	67	40	68	58	33	72.1
26	91	82	67	80	60	54	71	40	47	61	33	42	50	18	24	53.1
27	80	58	38	59	31	22	42	14	16	36	8	2	21	0	2	32.1
28	55	33	17	27	17	19	15	20	7	5	0	3	2	0	2	13.4
Postrainy/Post-pluvieuse (15.7 mm)																
29	26	29	22	18	8	11	9	17	7	3	50	3	2	0	3	8.2
30	24	0	6	11	0	2	8	0	2	5	0	0	3	0	0	7.6

W = Wet; W-W = Wet followed by wet; W-D = Wet followed by dry.
H = Humide; H+H = Humide suivi par humide; H+S = Humide suivi par sec.

Gaoua (1213.3 mm)

Decade	>10 mm			>20 mm			>30 mm			>40 mm			>50 mm			Mean/ Moyenne (mm)
	W H	W+W H+H	W+D H+S	W H	W+W H+H	W+D H+S	W H	W+W H+H	W+D H+S	W H	W+W H+H	W+D H+S	W H	W+W H+H	W+D H+S	
Prerainy/Pre-pluvieuse (9.9 mm)																
8	28	60	49	17	42	34	14	30	20	10	14	16	6	25	12	9.9
Rainy/Pluvieuse (1164.8 mm)																
9	52	43	53	35	32	41	21	13	29	15	0	22	13	0	16	17.6
10	48	62	62	38	41	50	25	22	40	18	15	24	14	10	15	20.4
11	62	73	74	46	55	53	35	36	48	23	25	36	14	30	16	26.1
12	73	85	68	54	71	64	44	52	60	34	50	45	18	54	34	31.2
13	80	91	86	68	69	78	56	55	48	46	55	37	38	48	32	43.0
14	90	95	86	72	82	90	52	76	59	45	59	54	38	44	52	40.8
15	94	96	75	85	82	82	68	77	70	56	58	61	49	37	53	56.3
16	94	96	75	82	90	77	75	87	72	59	71	66	45	59	54	48.8
17	94	96	100	87	84	78	83	71	67	69	51	68	56	30	58	55.3
18	96	96	100	83	83	100	70	68	86	56	52	71	42	47	51	51.8
19	96	94	67	86	89	90	73	85	74	61	79	71	49	63	61	61.7
20	93	98	60	89	90	63	82	86	69	76	74	65	62	64	52	70.9
21	96	94	33	87	90	67	83	86	58	72	73	60	59	67	59	73.5
22	92	98	67	87	94	78	82	90	62	69	86	64	63	82	62	77.3
23	96	100	33	92	97	67	85	92	73	79	86	73	75	75	56	88.1
24	97	100	0	94	99	50	89	97	75	83	93	67	70	88	67	89.8
25	97	99	50	96	93	67	94	88	50	89	75	50	82	66	54	84.7
26	97	100	50	92	89	67	86	85	50	72	69	55	63	64	31	75.3
27	99	90	0	87	76	33	80	53	36	65	26	32	52	24	24	62.7
28	89	65	25	70	60	33	49	40	39	28	20	25	24	6	17	37.0
29	61	74	54	52	59	32	39	43	28	24	35	22	14	20	10	27.1
30	66	40	33	46	18	21	34	4	17	25	6	9	11	0	8	25.4
Postrainy/Post-pluvieuse (18.5 mm)																
31	38	26	9	20	36	7	13	22	8	8	17	5	7	0	3	11.5
32	15	18	3	13	11	2	10	0	3	6	0	1	3	0	1	6.9

W = Wet; W+W = Wet followed by wet; W+D = Wet followed by dry.
H = Humlde; H+H = Humide suivi par humide; H+S = Humide suivi par sec.

Garango (870.5 mm)

Decade	>10 ram			>20 ram			>30 mm			>40 ram			>50 mm			Mean/ Moyenne (ram)
	W H	W-W H+H	W+D H+S	W H	W-W H+H	W+D H+S	W H	W-W H+H	W+D H+S	W H	W-W H+H	W+D H+S	W H	W-W H+H	W+D H+S	
Prerainy/Pre-pluvieuse (21.7 ram)																
11	19	43	40	14	60	31	8	33	21	8	33	12	3	100	0	7.6
12	41	60	64	35	46	46	22	50	31	14	20	31	3	0	17	14.1
Rainy/Pluvieuse (783.3 ram)																
13	62	61	64	46	24	60	35	23	29	30	9	23	16	17	13	25.8
14	62	74	71	43	63	57	27	50	37	19	57	27	14	60	25	23.0
15	73	74	80	59	41	53	41	33	32	32	25	16	30	27	12	34.6
16	76	89	89	46	71	75	32	50	68	19	43	43	16	17	26	24.7
17	89	85	50	73	78	60	62	65	43	43	44	38	24	22	25	35.8
18	81	90	86	73	78	70	57	81	63	41	67	55	24	67	43	38.4
19	89	97	75	76	96	89	73	93	90	59	77	80	49	72	53	52.8
20	95	94	100	95	91	100	92	76	67	78	69	75	62	65	57	67.2
21	95	97	100	92	97	100	76	89	89	70	85	82	62	87	64	64.1
22	97	100	100	97	92	100	89	91	100	84	84	100	78	76	100	81.1
23	100	95	0	92	88	100	92	85	100	86	78	100	81	73	100	89.4
24	95	97	100	89	94	100	86	91	80	81	83	86	78	72	75	82.9
25	97	97	0	95	91	50	89	85	50	84	81	50	73	56	60	73.9
26	95	83	0	89	67	25	81	40	29	76	21	22	57	19	25	60.4
27	78	45	38	62	43	29	38	29	22	22	25	17	22	13	7	29.1
Postrainy/Post-pluvieuse (40 ram)																
28	43	38	38	38	21	26	24	11	14	19	0	17	8	0	3	18.8
29	38	36	17	24	22	11	14	0	6	14	0	6	3	0	6	12.4
30	24	22	4	14	0	0	5	0	0	5	0	0	5	0	0	8.8

W = Wet; W-W = Wet followed by wet; W+D = Wet followed by dry.
H = Humide; H+H = Humide suivi par humide; H+S = Humide suivi par sec.

Hounde (966.1 mm)

Decade	>10 mm			>20 mm			>30 mm			>40 mm			>50 mm			Mean/ Moyenne (mm)
	W H	W+W H+H	W+D H+S	W H	W+W H+H	W+D H+S	W H	W+W H+H	W+D H+S	W H	W+W H+H	W+K) H+S	W H	W+W H+H	W+D H+S	
Prerainy/Pre-pluvieuse (22.1 mm)																
10	25	44	32	16	20	21	11	0	21	6	0	14	5	0	8	8.5
11	35	32	63	21	8	34	19	8	27	13	0	15	8	0	5	13.7
Rainy/Pluvieuse (904.3 mm)																
12	52	58	63	29	39	36	24	20	25	13	13	16	5	33	8	17.1
13	60	76	56	37	57	48	24	27	35	16	10	32	10	0	23	20.9
14	68	84	75	51	72	61	33	67	52	29	61	44	21	31	38	28.3
15	81	94	58	67	79	67	57	53	48	49	32	47	37	26	23	39.5
16	87	96	50	75	79	56	51	59	52	40	44	45	24	33	42	36.3
17	90	91	50	73	83	71	56	74	57	44	50	34	40	36	32	42.6
18	87	96	63	79	94	77	67	74	86	41	69	68	33	52	60	44.9
19	92	95	60	90	88	67	78	82	79	68	74	65	57	61	63	56.8
20	92	100	60	86	98	78	81	98	67	71	93	67	62	74	63	58.3
21	97	100	0	95	97	33	92	91	60	86	83	78	70	75	68	78.8
22	97	100	0	94	100	50	89	93	57	83	81	55	73	78	59	85.7
23	97	97	0	97	95	0	89	93	57	76	92	60	73	83	65	78.4
24	94	95	50	92	93	60	89	93	57	84	92	60	78	80	71	89.9
25	92	98	40	90	88	50	89	79	57	87	67	63	78	59	64	79.4
26	94	90	50	84	79	60	76	63	60	67	50	29	60	42	24	60.2
27	87	67	63	76	54	27	62	33	29	43	30	17	35	32	10	44.8
28	67	57	38	48	50	24	32	30	16	22	14	10	17	9	2	26.4
29	51	47	32	37	43	18	21	15	14	11	14	7	3	0	8	16.2
Postrainy / Post-pluvieuse (21 mm)																
30	40	20	16	27	24	13	14	0	9	8	0	9	8	0	7	13.7
31	17	0	6	16	0	4	8	0	2	8	0	2	6	0	0	7.3

W = Wet; W+W = Wet followed by wet; W+D = Wet followed by dry.
H = Humide; H+H = Humide suivi par humide; *H+S* = Humide suivi par sec.

Kantchari (782.1 mm)

Decade	>10 mm			>20 mm			>30 mm			>40 mm			>50 mm			Mean/ Moyenne (mm)
	W H	W+W H+H	W+D H+S	W H	W+W H+H	W+D H+S	W H	W+W H+H	W+D H+S	W H	W+W H+H	W+D H+S	W H	W+W H+H	W+D H+S	
Prerainy/Pre-pluvieuse (14.9 ram)																
11	15	50	33	8	0	14	3	0	8	3	0	3	0	0	3	5.2
12	36	57	52	13	60	41	8	0	33	3	0	21	3	0	13	9.7
Rainy/Pluvieuse (730.6 mm)																
13	54	57	67	44	29	41	31	17	15	21	13	6	13	20	3	21.9
14	62	71	67	36	71	48	15	33	45	8	33	19	5	0	14	17.3
15	69	81	83	56	64	65	44	47	45	21	38	35	13	60	24	26.0
16	82	84	71	64	64	64	46	39	57	36	43	48	28	55	29	33.9
17	82	84	100	64	68	79	49	58	55	46	33	38	36	14	32	44.9
18	87	97	80	72	93	91	56	73	59	36	64	60	26	60	38	36.8
19	95	95	100	92	89	67	67	77	69	62	67	60	44	59	59	49.1
20	95	92	100	87	91	100	74	86	100	64	68	79	59	65	56	60.8
21	92	100	100	92	94	100	90	86	100	72	75	91	62	67	73	72.4
22	100	92	0	95	92	100	87	88	100	79	84	88	69	70	83	69.1
23	92	100	100	92	94	100	90	89	100	85	79	83	74	66	70	87.5
24	100	97	0	95	86	100	90	77	75	79	55	88	67	42	62	76.0
25	97	95	100	87	76	80	77	70	67	62	67	60	49	47	45	57.3
26	95	78	100	77	53	56	69	33	42	64	20	7	46	11	10	52.0
27	79	29	38	54	29	11	36	7	12	15	0	12	10	0	3	25.6
Postrainy/Post-pluvieuse (26.7 mm)																
28	31	33	15	21	25	6	10	0	9	10	0	6	3	0	5	11.6
29	21	50	13	10	50	11	8	67	8	5	100	3	5	50	0	7.7
30	21	13	3	15	17	0	13	0	0	8	0	0	3	0	0	7.3

W = Wet; W+W = Wet followed by wet; W+D = Wet followed by dry.
H = Humide; H+H = Humide suivi par humide; H+S - Humide suivi par sec.

K a y a (689 mm)

Decade	>10 mm			>20 mm			>30 mm			>40 mm			>50 mm			Mean/ Moyenne (mm)
	W H	W#W H+H	W+D H+S	W H	W#W H+H	W+D H+S	W H	W#W H+H	W+D H+S	W H	W#W H+H	W+D H+S	W H	W#W H+H	W+D H+S	
Prerainy/Pre-pluvieuse (26.4 mm)																
12	15	70	27	3	0	16	2	0	6	2	0	5	2	0	3	4.5
13	33	41	34	15	40	18	6	50	13	5	33	8	3	0	5	9.5
14	36	63	62	21	57	48	15	40	34	9	17	27	5	0	6	12.4
Ra1ny/Pluv1euse (625.5 mm)																
15	62	83	72	50	64	52	35	48	35	26	47	22	6	0	16	23.9
16	79	81	71	58	58	68	39	42	40	29	42	30	15	30	18	30.8
17	79	87	71	62	68	60	41	52	41	33	32	34	20	15	21	31.1
18	83	96	91	65	86	83	45	63	67	33	50	55	20	31	40	35.2
19	95	86	33	85	73	50	65	60	52	53	54	52	38	44	44	46.0
20	83	98	91	70	89	90	58	82	82	53	71	77	44	62	65	46.6
21	97	95	50	89	90	86	82	89	83	74	78	65	64	67	67	65.6
22	94	100	75	89	98	86	88	93	75	74	82	76	67	75	68	73.3
23	98	97	0	97	91	50	91	88	50	80	74	77	73	71	61	81.1
24	95	94	100	89	85	100	85	73	80	74	59	53	68	42	38	71.5
25	94	84	75	86	75	56	74	59	53	58	37	50	41	41	31	53.1
26	83	75	36	73	56	17	58	50	18	42	32	21	35	9	14	42.3
21	68	38	33	45	20	22	36	17	7	26	18	2	12	25	2	25.0
Postrainy/Post-pluvieuse (25.7 mm)																
28	36	38	21	21	21	13	11	0	7	6	0	3	5	0	2	11.0
29	27	17	19	15	20	4	6	25	5	3	50	3	2	100	3	8.4
30	18	8	4	6	0	2	6	0	2	5	0	0	5	0	0	6.3

W = Wet; W#W = Wet followed by wet; W+D = Wet followed by dry.
H = Humide; H+H = Humide suivi par humide; H+S = Humide suivi par sec.

Koudougou (825.9 mm)

Decade	>10 mm			>20 mm			>30 mm			>40 mm			>50 mm			Mean/ Moyenne (mm)
	W H	W→W H+H	W+D H+S	w H	w+w H+H	W+D H+S	W H	W→W H+H	W+D H+S	W H	W→W H+H	W+D H+S	W H	W→W H+H	W+D H+S	
Prerainy/Pre-pluvieuse (29.7 mm)																
11	27	12	45	11	0	21	3	0	11	0	0	8	0	0	6	6.0
12	36	39	46	19	25	23	11	14	9	8	0	5	6	0	2	11.4
13	44	54	58	23	27	37	9	0	16	5	0	8	2	0	5	12.4
Rainy/Pluvieuse (755.9 mm)																
14	56	78	71	34	77	45	14	89	38	8	80	31	5	100	25	16.1
15	75	83	69	56	64	50	45	41	46	34	27	33	28	17	22	32.5
16	80	80	85	58	68	63	44	57	47	31	50	30	20	46	25	30.7
17	81	90	75	66	74	73	52	55	45	36	48	34	30	37	24	35.3
18	88	93	88	73	72	88	50	53	72	39	48	46	28	44	33	39.9
19	92	95	80	77	82	80	63	75	67	47	60	68	36	52	61	44.3
20	94	97	75	81	90	92	72	87	83	64	73	70	58	59	52	57.6
21	95	93	67	91	91	83	86	87	78	72	83	78	56	67	71	70.9
22	92	100	40	91	97	50	86	89	44	81	79	50	69	75	55	73.3
23	95	100	0	92	95	40	83	94	73	73	89	82	69	84	70	80.5
24	95	100	100	91	97	100	91	88	100	88	80	38	80	65	54	91.3
25	100	92	0	97	87	50	89	75	71	75	67	69	63	50	58	67.7
26	92	80	60	86	69	33	75	56	13	67	40	19	53	38	20	59.1
27	78	60	86	64	46	43	45	24	26	33	19	12	30	16	7	35.6
28	66	36	55	45	28	29	25	13	17	14	0	11	9	0	9	21.1
Postrainy/Post-pluvieuse (26.2 mm)																
29	42	30	19	28	39	9	16	10	7	9	0	3	8	0	2	15.5
30	23	13	16	17	18	0	8	0	0	3	0	0	2	0	0	7.9
31	16	0	0	3	0	0	0	0	0	0	0	0	0	0	0	2.8

W = Wet; W→W = Wet followed by wet; W+D = Wet followed by dry.
H = Humide; H+H = Humide suivi par humide; H+S = Humide suivi par sec.

Koupela (821.1 mm)

Decade	>10 mm			>20 mm			>30 mm			>40 mm			>50 mm			Mean/ Moyenne (mm)
	W H	W→W H+H	W→D H+S	W H	W→W H+H	W→D H+S	W H	W→W H+H	W→D *H+S*	W H	W→W H+H	W→D H+S	W H	W→W H+H	W→D H+S	
Prerainy/Pre-pluvieuse (19.7 mm)																
11	22	38	34	7	25	23	7	0	20	3	0	14	2	0	5	6.2
12	35	48	56	23	43	39	18	45	18	13	38	13	5	33	7	13.4
Rainy/Pluvieuse (751 mm)																
13	53	78	57	40	67	50	23	57	33	17	10	22	8	20	16	20.4
14	68	80	68	57	62	54	38	48	35	20	42	23	17	40	10	27.8
15	77	72	79	58	54	68	40	42	44	27	38	32	15	22	24	28.5
16	73	91	81	60	75	75	43	46	68	33	30	45	23	7	26	30.4
17	88	91	57	75	82	60	58	63	48	40	38	39	22	23	28	36.9
18	87	94	100	77	83	71	57	74	62	38	52	49	27	38	34	40.2
19	95	98	100	80	90	100	68	83	79	50	77	50	35	52	46	45.3
20	98	98	100	92	95	80	82	88	82	63	82	68	48	69	55	55.9
21	98	100	100	93	95	75	87	92	75	77	87	79	62	78	65	65.5
22	100	98	0	93	95	100	90	89	100	85	82	89	73	75	81	80.2
23	98	98	100	95	96	100	90	87	100	83	74	90	77	61	64	89.1
24	98	98	100	97	95	100	88	87	100	77	78	86	62	65	74	78.1
25	98	95	100	95	77	100	88	75	43	80	52	50	68	34	42	69.7
26	95	79	100	78	49	62	72	37	41	52	26	28	37	27	21	52.9
27	80	44	42	52	23	34	38	22	19	27	6	9	23	7	9	30.0
Postrainy/Post-pluvieuse (34.1 mm)																
28	43	27	44	28	6	21	20	0	10	8	0	5	8	0	2	16.6
29	37	32	13	17	20	8	8	20	9	5	0	7	2	0	5	10.2
30	20	17	4	10	0	2	10	0	2	7	0	2	5	0	2	7.3

W = Wet; W→W = Wet followed by wet; W→D = Wet followed by dry.
H = Humide; H+H = Humide suivi par humide; H+S = Humide suivi par sec.

Leo (960.3 mm)

Decade	>10 mm			>20 mm			>30 mm			>40 mm			>50 mm			Mean/ Moyenne (mm)
	W H	W+W H+H	W+D H+S	W H	W+W H+H	W+D H+S	W H	W+W H+H	W+D H+S	W H	W+W H+H	W-K) H+S	W H	W+W H+H	W+D H+S	
Prerainy/Pre-pluvieuse (19.5 mm)																
9	28	44	26	14	0	20	11	0	5	6	0	3	5	0	2	10.0
10	31	40	53	17	27	35	5	0	27	3	0	19	2	0	16	9.5
Rainy/Pluvieuse (893.2 mm)																
11	49	50	58	34	32	47	26	18	33	18	8	21	15	10	15	19.8
12	54	54	70	42	41	45	29	26	28	18	17	19	14	11	11	22.5
13	62	68	72	43	54	54	28	39	40	18	17	30	11	14	21	22.7
14	69	98	85	54	89	70	40	73	62	28	50	49	20	38	40	30.4
15	94	84	75	80	77	46	66	56	50	49	31	42	40	19	26	43.0
16	83	96	82	71	87	79	54	71	67	37	58	41	23	33	40	35.1
17	94	92	50	85	78	80	69	69	60	48	55	50	38	44	30	46.5
18	89	86	86	78	78	93	66	72	64	52	68	52	35	35	43	42.5
19	86	93	78	82	91	75	69	82	85	60	64	81	40	58	51	45.2
20	91	97	67	88	88	50	83	78	64	71	67	68	54	57	73	65.0
21	94	97	50	83	91	82	75	80	81	68	80	57	65	64	52	69.4
22	94	100	50	89	98	71	80	92	69	72	85	78	60	72	69	72.4
23	97	98	0	95	98	33	88	98	63	83	91	73	71	83	63	80.7
24	95	98	33	95	94	33	94	92	50	88	82	50	77	74	53	88.5
25	95	97	33	91	92	67	89	83	43	78	78	57	69	73	65	75.1
26	94	92	25	89	86	43	78	73	50	74	50	35	71	43	26	64.5
27	88	61	75	82	53	42	68	34	29	46	30	23	38	28	10	44.9
28	63	49	29	51	42	22	32	24	18	26	24	10	17	18	6	24.8
Postrainy/Post-pluvieuse (27.6 mm)																
29	42	33	34	32	29	20	20	23	8	14	11	5	8	20	3	16.1
30	34	23	9	23	7	10	11	0	5	6	0	0	5	0	0	11.5

W = Wet; W+W = Wet followed by wet; W+D = Wet followed by dry.
H = Humide; H+H = Humide suivi par humide; H+S = Humide suivi par sec.

Manga (885.3 mm)

Decade	>10 mm			>20 mm			>30 mm			>40 mm			>50 mm			Mean/ Moyenne (mm)
	W H	W#W H+H	W#D H+S	W H	W#W H+H	W#D H+S	W H	W#W H+H	W#D H+S	W H	W#W H+H	W#D H+S	W H	W#W H+H	W#D H+S	
Prerainy/Pre-pluvieuse (28 mm)																
9	35	17	32	15	0	7	6	0	3	3	0	3	3	0	0	9.7
10	26	22	36	6	0	25	3	0	18	3	0	9	0	0	9	6.2
11	32	45	57	24	25	35	18	17	18	9	33	13	9	33	6	12.2
Rainy/Pluvieuse (818.9 mm)																
12	53	72	56	32	73	39	18	17	29	15	20	21	9	0	19	17.0
13	65	82	75	50	47	65	26	33	40	21	0	33	18	0	25	24.9
14	79	93	100	56	74	73	38	46	52	26	33	40	21	14	30	28.8
15	94	84	100	74	64	67	50	41	59	38	23	43	26	0	24	37.4
16	85	97	100	65	82	100	50	59	59	35	33	32	18	0	29	33.3
17	97	85	100	88	73	50	59	55	50	32	55	39	24	38	27	39.1
18	85	93	100	71	79	100	53	61	63	44	73	42	29	40	29	39.9
19	94	94	50	85	90	80	62	81	77	56	68	73	32	45	52	44.1
20	91	100	67	88	100	75	79	89	86	71	75	90	50	59	65	60.8
21	97	97	100	97	97	100	88	90	100	79	81	86	62	62	85	68.8
22	97	100	0	97	100	0	91	94	67	82	89	83	71	79	80	73.2
23	97	97	0	97	91	0	91	87	67	88	77	75	79	74	71	87.3
24	94	100	50	88	100	50	85	97	60	76	85	50	74	76	22	85.5
25	97	94	0	94	88	50	91	74	67	76	58	75	62	48	38	68.2
26	91	84	67	85	62	80	74	52	44	62	48	31	44	27	21	56.7
27	82	61	67	65	36	42	50	24	24	41	14	5	24	0	4	36.4
28	62	43	31	38	31	29	24	13	19	9	0	13	3	0	9	17.7
Postrainy/Post-pluvieuse (29.7 mm)																
29	38	46	10	29	40	8	18	67	4	12	50	3	9	33	6	16.1
30	24	38	12	18	0	4	15	0	0	9	0	0	9	0	0	10.4
31	18	0	0	3	0	0	0	0	0	0	0	0	0	0	0	3.0

W = Wet; W#W = Wet followed by wet; W#D = Wet followed by dry.
H = Humide; H+H = Humide suivi par humide; H+S = Humide suivi par sec.

Markoye (392.2 mm)

Decade	>10 mm			>20 mm			>30 mm			>40 mm			>50 mm			Mean/ Moyenne (mm)
	W H	W+W H+H	W+D H+S	W H	W+W H+H	W+D H+S	W H	W+W H+H	W+D H+S	W H	W+W H+H	W+D H+S	W H	W+W H+H	W+D H+S	
Prerainy/Pre-pluvieuse (13 mm)																
16	45	54	50	21	67	30	14	75	20	7	50	22	3	0	18	13.0
Rainy/Pluvieuse (335.1 mm)																
17	52	53	64	38	55	33	28	38	29	24	43	23	17	0	13	20.9
18	59	82	67	41	50	65	31	33	40	28	25	14	10	0	12	22.7
19	76	82	71	59	71	67	38	55	39	17	60	25	10	67	27	26.8
20	79	83	83	69	75	78	45	69	63	31	56	65	31	22	50	35.0
21	83	96	100	76	95	57	66	84	50	62	72	18	41	58	24	45.3
22	97	86	100	86	72	100	72	52	63	52	27	57	38	27	44	46.0
23	86	92	50	76	86	71	55	63	69	41	42	47	38	18	44	42.3
24	86	84	50	83	75	20	66	37	30	45	31	13	34	10	11	46.6
25	79	57	67	66	42	40	34	20	26	21	0	22	10	0	15	27.6
26	59	24	50	41	8	35	24	0	18	17	0	8	14	0	4	21.9
Postrainy/Post-pluvieuse (25.2 mm)																
27	34	40	21	24	14	9	14	25	0	7	0	4	3	0	0	12.1
28	*28*	38	10	10	33	8	3	100	7	3	0	7	0	0	0	6.8
29	17	20	4	10	0	0	10	0	0	7	0	0	0	0	0	6.2

W = Wet; W+W = Wet followed by wet; W+D = Wet followed by dry.
H = Humide; H+H = Humide suivi par humide; H+S = Humide suivi par sec.

Niangoloko (1245.2 mm)

Decade	>10 mm			>20 mm			>30 mm			>40 mm			>50 mm			Mean/ Moyenne (mm)
	W H	W+W H+H	W+D H+S	W H	W+W H+H	W+D H+S	W H	W+W H+H	W+D H+S	W H	W+W H+H	W+D H+S	W H	W+W H+H	W+D H+S	
Prerainy/Pre-pluvieuse (63.3 mm)																
6	21	29	15	12	0	3	6	0	3	6	0	3	6	0	3	7.2
7	18	33	37	3	0	22	3	0	13	3	0	9	3	0	3	5.3
8	36	58	57	21	14	38	12	25	21	9	33	17	3	0	13	10.8
9	58	42	36	33	27	23	21	29	19	18	17	19	12	25	14	20.7
10	39	77	75	24	38	60	21	29	46	18	17	22	15	20	18	19.3
Rainy/Pluvieuse (1147.5 mm)																
11	76	68	75	55	44	40	42	29	37	21	43	19	18	33	19	29.2
12	70	78	90	42	29	47	33	36	36	24	38	24	21	14	12	26.9
13	82	81	83	39	77	75	36	42	57	27	33	50	12	25	31	27.0
14	82	85	100	76	80	88	52	71	69	45	67	50	30	30	52	38.7
15	88	83	100	82	78	67	70	61	60	58	47	36	45	40	33	51.1
16	85	96	80	76	92	63	61	80	77	42	71	68	36	58	67	49.1
17	94	94	100	85	93	80	79	81	71	70	61	70	64	38	67	60.6
18	94	90	50	91	80	67	79	73	57	64	62	42	48	50	35	55.7
19	88	97	50	79	92	71	70	91	70	55	94	73	42	86	68	55.8
20	91	97	67	88	97	75	85	79	80	85	75	80	76	60	75	78.5
21	94	94	100	94	87	50	79	92	57	76	88	50	64	81	50	66.0
22	94	100	50	85	96	80	85	93	60	79	88	71	70	83	70	86.1
23	97	100	100	94	100	100	88	97	100	85	93	100	79	92	86	103.4
24	100	97	0	100	94	0	97	88	100	94	84	100	91	80	100	113.7
25	97	100	0	94	97	50	88	86	75	85	75	60	82	63	67	83.2
26	97	100	100	94	97	100	85	86	80	73	83	67	64	71	50	73.0
27	100	82	0	97	72	100	85	57	20	79	38	14	64	24	0	67.6
28	82	67	17	73	50	11	52	29	13	33	9	9	15	20	4	32.3
29	58	79	57	39	54	30	21	29	23	9	67	13	6	100	6	18.7
30	70	26	40	39	8	35	24	0	12	18	0	7	12	0	3	30.9
Postrainy/Post-pluvieuse (16.4 mm)																
31	30	30	9	24	13	8	9	0	10	6	0	6	3	0	3	10.3
32	15	0	7	9	0	7	9	0	3	6	0	3	3	0	0	6.2

W = Wet; W+W = Wet followed by wet; W+D = Wet followed by dry.
H = Humide; H+H = Humide suivi par humide; H+S - Humide suivi par sec.

Nouna (814.1 mm)

Decade	>10 mm			>20 mm			>30 mm			>40 mm			>50 mm			Mean/ Moyenne (mm)
	W H	W+W H+H	W+D H+S	W H	W+W H+H	W+D H+S	W H	W+W H+H	W+D H+S	W H	W+W H+H	W+D H+S	W H	W+W H+H	W+D H+S	
Prerainy/Pri-pluvieuse (20.6 mm)																
12	30	31	43	9	0	28	7	0	15	5	0	7	5	0	0	8.7
13	40	76	58	26	55	44	14	17	22	7	33	13	0	0	2	11.9
Rainy/Pluvieuse (767.7 mm)																
14	65	61	67	47	40	70	21	11	47	14	17	24	2	100	12	20.9
15	63	81	81	56	71	63	40	59	46	23	70	42	14	50	30	27.5
16	81	89	75	67	83	71	51	73	57	49	38	45	33	21	31	38.1
17	86	92	100	79	68	89	65	61	67	42	50	40	28	42	29	40.8
18	93	95	100	72	77	92	63	67	81	44	53	71	33	50	52	39.8
19	95	95	100	81	83	88	72	74	75	63	63	63	51	59	52	51.9
20	95	100	100	84	100	100	74	100	100	63	81	100	56	67	84	58.7
21	100	98	0	100	95	0	100	86	0	88	79	60	74	69	73	80.0
22	98	100	100	95	98	100	86	97	100	77	94	80	70	90	62	77.1
23	100	98	0	98	98	100	98	95	100	91	82	100	81	63	88	80.8
24	98	98	100	98	86	100	95	71	100	84	50	86	67	41	57	83.6
25	98	95	100	86	86	83	72	68	58	56	58	47	47	50	35	53.5
26	95	63	100	86	54	83	65	39	27	53	13	30	42	6	20	53.3
27	65	71	40	58	48	22	35	47	18	21	33	15	14	17	8	25.9
28	60	42	59	37	19	30	28	8	16	19	0	9	9	0	5	21.4
29	49	29	27	26	27	9	14	17	3	7	33	0	5	50	0	14.4
Postrainy/Post-pluvieuse (7.3 mm)																
30	28	8	6	14	0	3	5	0	2	2	0	0	2	0	0	7.3

W = Wet; W+W = Wet followed by wet; W+D = Wet followed by dry.
H = Humlde; H+H = Humide suivi par humide; H+S = Humide suivi par sec.

Ouagadougou (827.7 mm)

Decade	>10 mm			>20 mm			>30 mm			>40 mm			>50 mm			Mean/ Moyenne (mm)
	W H	W+W H+H	W+D H+S	W H	W+W H+H	W+D H+S	W H	W+W H+H	W+D H+S	W H	W+W H+H	W+D H+S	W H	W+W H+H	W+D H+S	
Prerainy/Pre-pluvieuse (19.8 mm)																
11	18	0	44	12	0	24	6	0	13	6	0	10	3	0	6	7.2
12	36	67	57	21	43	46	12	0	24	9	0	13	6	0	3	12.6
Rainy/Pluvieuse (776.3 urn)																
13	61	70	54	45	33	44	21	43	23	12	50	14	3	0	6	17.9
14	64	71	92	39	54	75	27	56	63	18	33	56	6	0	39	20.6
15	79	96	57	67	77	64	61	50	54	52	24	44	36	25	14	46.4
16	88	79	75	73	75	78	52	59	56	33	64	32	18	33	30	34.2
17	79	96	100	76	80	100	58	63	64	42	43	42	30	40	35	39.6
18	97	97	100	85	79	80	64	81	75	42	71	63	36	50	38	42.9
19	97	97	100	79	100	71	79	96	71	67	82	73	42	86	47	46.0
20	97	100	100	94	100	100	91	90	100	79	85	86	64	76	67	58.7
21	100	100	0	100	94	0	91	87	100	85	71	80	73	54	78	73.6
22	100	91	0	94	87	100	88	86	100	73	88	67	61	80	54	62.9
23	91	100	100	88	97	100	88	93	100	82	85	100	70	78	70	84.8
24	100	100	0	97	97	100	94	90	100	88	69	75	76	64	63	87.1
25	100	88	0	97	72	100	91	67	67	70	52	50	64	52	33	62.7
26	88	90	100	73	58	78	67	36	45	52	29	19	45	27	11	51.3
27	91	60	100	64	29	42	39	15	15	24	13	4	18	17	0	31.8
28	64	29	42	33	18	9	15	0	11	6	0	6	3	0	6	16.0
Postrainy/Post-pluvieuse (17 mm)																
29	33	27	14	12	25	7	9	0	3	6	0	3	6	0	3	10.6
30	18	17	7	9	0	3	3	0	0	3	0	0	3	0	0	6.4

W = Wet; W+W = Wet followed by wet; W+D = Wet followed by dry.
H = Humide; H+H = Humide suivi par humide; H+S = Humide suivi par sec.

Ouahigouya (688.9 mm)

Decade	>10 mm			>20 mm			>30 mm			>40 mm			>50 mm			Mean/ Moyenne (mm)
	W H	W+W H+H	W+D H+S	W H	W+W H+H	W+D H+S	W H	W+W H+H	W+D H+S	W H	W+W H+H	W-H) H+S	W H	W+W H+H	W+D H+S	
Prerainy/Pre-pluvieuse (22.9 mm)																
12	15	11	25	10	0	11	7	0	4	7	0	4	3	0	3	6.5
13	23	57	26	10	0	13	3	0	5	3	0	3	3	0	3	7.3
14	33	60	50	12	57	34	5	33	25	3	0	19	3	0	14	9.1
Rainy/Pluvieuse (626.6 mm)																
15	53	69	75	37	55	42	25	47	22	18	36	12	13	50	8	18.6
16	72	88	59	47	75	50	28	53	44	17	20	36	13	13	25	24.0
17	80	88	92	62	65	83	47	46	53	33	20	40	23	21	28	31.4
18	88	89	100	72	84	82	50	70	67	33	60	52	27	44	34	36.5
19	90	94	33	83	86	60	68	71	68	55	58	59	37	27	50	46.1
20	88	100	100	82	92	91	70	86	94	58	63	84	42	52	71	51.4
21	100	95	0	92	85	100	88	81	86	72	77	76	63	74	73	75.3
22	95	95	0	87	90	63	82	86	73	77	78	57	73	73	50	68.4
23	90	96	100	87	94	88	83	90	80	73	77	88	67	58	85	76.7
24	97	90	0	93	84	50	88	68	29	80	54	42	67	35	40	79.6
25	87	90	63	82	78	45	63	50	55	52	32	55	37	36	34	46.4
26	87	69	88	72	44	65	52	35	41	43	31	32	35	14	26	38.6
21	72	51	24	50	30	10	38	26	11	32	26	7	22	15	4	33.6
Postrainy/Post-pluvieuse (29.8 mm)																
28	43	42	18	20	8	19	17	10	8	13	0	0	7	0	0	15.4
29	28	35	19	17	10	8	8	0	7	0	0	3	0	0	0	8.1
30	23	0	4	8	0	0	7	0	0	3	0	0	0	0	0	6.2

W = Wet; W+W = Wet followed by wet; W+D = Wet followed by dry.
H = Humide; H+H = Humide suivi par humide; H+S = Humide suivi par sec.

Pama (953.7 mm)

Decade	>10 mm			>20 mm			>30 mm			>40 mm			>50 mm			Mean/ Moyenne (mm)
	W H	W-W H+H	W+D H+S	W H	W-W H+H	W+D H+S	W H	W+W H+H	W+D H+S	W H	W-W H+H	W+D H+S	W H	W+W H+H	W+D H+S	
Prerainy/Pre-pluvieuse (46 mm)																
9	23	13	30	17	17	17	14	20	10	9	0	0	3	0	0	9.4
10	26	56	38	17	33	21	11	25	19	0	0	20	0	0	14	7.6
11	43	27	50	23	13	30	20	14	14	20	0	11	14	0	7	15.0
12	40	79	71	26	67	54	14	20	37	9	0	19	6	0	9	13.9
Rainy/Pluvieuse (878.9 mm)																
13	74	73	56	57	45	60	34	17	39	17	17	21	9	33	16	26.2
14	69	79	100	51	67	88	31	55	63	20	43	32	17	33	24	23.9
15	86	87	100	77	74	88	60	71	71	34	50	52	26	44	19	42.2
16	89	97	75	77	78	63	71	76	70	51	61	47	26	22	31	38.6
17	94	91	50	74	85	78	74	54	67	54	37	56	29	10	44	42.7
18	89	87	100	83	83	83	57	80	67	46	88	42	34	75	43	43.4
19	89	94	100	83	93	100	74	81	89	63	77	46	54	68	56	53.6
20	94	97	100	94	94	100	83	90	83	66	87	50	63	82	31	62.5
21	97	100	100	94	88	100	89	77	100	74	62	89	63	50	54	73.9
22	100	94	0	89	97	75	80	96	71	69	92	73	51	83	71	70.6
23	94	100	100	94	97	100	91	94	100	86	90	100	77	81	100	82.7
24	100	94	0	97	85	100	94	85	100	91	88	67	86	70	80	96.2
25	94	100	100	86	97	80	86	87	60	86	70	60	71	64	60	78.2
26	100	89	0	94	73	100	83	66	67	69	42	55	63	41	38	74.8
27	89	65	75	74	38	56	66	39	17	46	25	21	40	7	14	43.7
28	66	30	17	43	20	10	31	0	17	23	0	11	11	0	0	25.8
Postrainy/Post-pluvieuse (17.8 mm)																
29	26	56	27	14	40	10	11	25	6	9	0	3	0	0	3	9.2
30	34	17	0	14	40	0	9	33	0	3	0	0	3	0	0	8.6

W = Wet; W-W = Wet followed by wet; W+D = Wet followed by dry.
H = Humide; H+H = Humide suivi par humide; H+S = Humide suivi par sec.

PO (928.8 mm)

Decade	>10 mm			>20 mm			>30 mm			>40 ram			>50 ram			Mean/ Moyenne (mm)
	W H	W+W H+H	W+D H+S	W H	W+W H+H	W+D H+S	W H	W+W H+H	W+D H+S	W H	W+W H+H	W+D H+S	W H	W+W H+H	W+D H+S	
Prerainy/Pre-pluvieuse (30.3 ram)																
9	24	30	16	10	25	11	5	0	10	5	0	8	5	0	3	7.3
10	19	75	32	12	40	27	10	25	26	7	0	13	2	0	7	7.7
11	40	65	52	29	50	40	26	27	23	12	20	11	7	0	5	15.3
Rainy/Pluvieuse (857.1 mm)																
12	57	63	72	43	39	58	24	30	44	12	0	24	5	0	10	18.5
13	67	61	93	50	57	48	40	35	36	21	11	21	10	0	13	24.9
14	71	83	83	52	59	65	36	47	56	19	50	47	12	20	32	26.6
15	83	86	86	62	81	63	52	64	55	48	45	45	31	23	41	40.4
16	86	92	67	74	81	55	60	64	47	45	53	43	36	40	33	40.9
17	88	89	60	74	77	73	57	67	50	48	55	27	36	53	22	42.2
18	86	92	83	76	75	70	60	60	65	40	76	44	33	57	36	42.0
19	90	95	75	74	87	91	62	73	94	57	67	78	43	72	63	44.1
20	93	95	67	88	86	60	81	76	63	71	63	67	67	43	57	59.0
21	93	97	67	83	89	86	74	87	82	64	89	73	48	85	77	66.1
22	95	100	50	88	97	80	86	94	83	83	83	71	81	76	75	81.1
23	98	98	0	95	98	50	93	85	67	81	71	88	76	66	90	83.6
24	95	100	50	95	93	50	83	86	71	74	77	64	71	73	58	90.1
25	98	98	0	90	97	50	83	91	57	74	81	55	69	66	46	73.0
26	95	93	50	93	82	33	86	61	33	74	48	45	60	36	35	61.2
27	90	66	0	79	48	22	57	25	22	48	25	14	36	20	7	42.6
28	60	56	24	43	33	25	24	0	9	19	0	6	12	0	5	20.9
Postrainy/Post-pluvieuse (26.1 mm)																
29	43	56	38	29	42	20	7	67	13	5	50	8	5	50	3	12.2
30	45	16	9	26	27	3	17	14	0	10	0	0	5	0	0	13.9

W = Wet; W+W = Wet followed by wet; W+D = Wet followed by dry.
H = Humide; H+H = Humide suivi par humide; H+S = Humide suivi par sec.

Saria (819.6 mm)

Decade	>10 mm			>20 mm			>30 mm			>40 mm			>50 mm			Mean/ Moyenne (mm)
	W H	W-W H+H	W+D H+S	W H	W-W H+H	W+D H+S	W H	W-W H+H	W+D H+S	W H	W-W H+H	W+D H+S	W H	W-W H+H	W+D H+S	
Prerainy/Pre-pluvieuse (22.5 mm)																
11	25	40	37	13	0	31	5	0	18	3	0	13	0	0	5	7.4
12	38	40	60	28	9	38	18	0	27	13	0	17	5	0	8	15.0
Rainy/Pluvieuse (769.4 mm)																
13	52	57	74	30	25	39	23	11	23	15	0	18	8	0	14	16.8
14	65	69	79	35	57	62	20	38	56	15	33	44	13	0	31	21.0
15	73	93	55	60	71	50	52	57	32	43	41	17	28	27	14	32.1
16	83	88	86	63	72	53	45	50	50	28	36	41	18	0	27	33.7
17	88	94	100	65	65	86	50	50	75	40	38	46	23	22	39	35.8
18	95	92	50	73	79	82	63	64	73	43	41	65	35	29	46	42.9
19	90	100	100	80	97	75	68	89	46	55	77	56	40	75	58	46.3
20	100	98	0	93	97	67	75	97	60	68	93	62	65	73	64	61.0
21	98	100	100	95	97	100	88	91	100	83	79	86	70	71	75	72.7
22	100	98	0	98	95	0	93	89	67	80	75	88	73	62	73	72.4
23	98	100	100	93	100	100	88	100	100	78	90	89	65	81	93	73.2
24	100	98	0	100	90	0	100	83	0	90	81	75	85	62	67	89.9
25	98	95	100	90	86	75	83	82	57	80	72	50	63	60	53	64.6
26	95	87	100	85	71	50	78	48	33	68	26	8	58	22	6	58.6
27	88	51	40	68	44	31	45	39	14	20	25	9	15	17	9	29.9
28	50	35	40	40	13	21	25	0	13	13	0	6	10	0	3	18.6
Postrainy/Post-pluvieuse (17.2 mm)																
29	38	27	16	18	29	3	10	25	3	5	50	0	3	0	3	11.2
30	20	13	3	8	0	3	5	0	0	3	0	0	3	0	0	6.0

W = Wet; W-W = Wet followed by wet; W+D = Wet followed by dry.
H = Humide; H+H = Humide suivi par humide; H+S = Humide suivi par sec.

Tenkodogo (915.9 mm)

Decade	>10 mm			>20 mm			>30 mm			>40 mm			>50 mm			Mean/ Moyenne (mm)
	W H	W+W H+H	W+D H+S	W H	W+W H+H	W+D H+S	W H	W+W H+H	W+D H+S	W H	W+W H+H	W+D H+S	W H	W+W H+H	W+D H+S	
Prerainy/Pre-pluvieuse (37.2 mm)																
9	21	15	20	8	0	12	3	0	5	2	0	5	2	0	5	5.6
10	19	25	25	11	14	11	5	0	7	5	0	3	5	0	3	7.5
11	25	25	43	11	0	32	6	0	25	3	0	15	3	0	15	8.1
12	38	54	59	29	33	44	24	27	33	14	11	28	14	11	19	15.9
Rainy/Pluvieuse (847.7 mm)																
13	57	67	63	41	65	54	32	40	35	25	6	26	17	0	19	26.0
14	65	85	91	59	73	62	37	52	43	21	54	28	16	30	26	26.5
15	87	76	75	68	51	60	46	31	41	33	24	29	27	18	24	40.2
16	76	92	67	54	88	62	37	78	50	27	71	33	22	36	18	31.5
17	86	91	89	76	69	93	60	63	68	43	48	44	22	29	39	35.2
18	90	79	83	75	77	69	65	56	55	46	45	47	37	39	40	50.2
19	79	88	69	75	83	75	56	77	61	46	62	59	40	48	39	43.8
20	84	98	90	81	90	92	70	75	89	60	71	68	43	70	58	53.3
21	97	93	50	90	93	83	79	84	92	70	75	74	63	63	70	75.3
22	92	97	20	92	95	20	86	89	56	75	83	63	65	76	50	80.9
23	90	98	100	89	96	100	84	94	100	78	86	100	67	74	95	86.6
24	98	95	100	97	93	100	95	90	100	89	82	71	81	73	58	101.1
25	95	95	0	94	85	25	90	82	50	81	69	67	70	55	53	75.8
26	90	82	100	81	65	100	79	50	85	68	44	65	54	24	59	56.7
27	84	53	70	71	27	28	57	14	15	51	9	10	40	8	5	47.5
28	56	43	14	27	35	9	14	11	9	10	17	2	6	25	0	17.0
Postrainy/Post-pluvieuse (20.6 mm)																
29	30	37	30	16	30	19	10	17	16	3	0	7	2	0	6	8.9
30	32	5	2	21	0	0	16	0	0	6	0	0	6	0	0	11.6

W = Wet; W+W = Wet followed by wet; W+D = Wet followed by dry.
H = Humide; H+H = Humide suivi par humide; H+S = Humide suivi par sec.

Tougan (732.1 mm)

Decade	>10 mm			>20 mm			>30 mm			>40 mm			>50 mm			Mean/ Moyenne (mm)
	W H	W+W H+H	W+D H+S	W H	W+W H+H	W+D H+S	W H	W+W H+H	W+D H+S	W H	W+W H+H	W+D H+S	W H	W+W H+H	W+D H+S	
Prerainy/Pre-pluvieuse (26.7 mm)																
12	25	19	26	14	11	13	11	0	11	6	0	7	3	0	5	8.9
13	24	53	21	13	25	16	10	17	7	6	25	5	5	0	0	8.4
14	29	50	69	17	27	52	8	20	34	6	25	27	0	0	13	9.3
Rainy/Pluvieuse (653.9 mm)																
15	63	55	70	48	33	52	33	14	38	27	0	22	13	0	13	27.4
16	60	76	44	43	59	42	30	37	34	16	20	26	11	0	16	22.9
17	63	90	91	49	81	69	35	73	61	25	50	47	14	33	37	24.7
18	90	67	100	75	60	100	65	49	77	48	37	52	37	22	48	49.1
19	70	95	37	70	93	32	59	78	38	44	57	29	38	50	26	36.6
20	78	96	100	75	91	100	62	87	96	41	81	92	35	68	85	42.3
21	97	80	100	94	75	100	90	68	100	87	58	100	79	44	85	90.8
22	81	98	0	76	96	20	71	91	33	63	80	48	52	76	47	58.0
23	79	100	92	78	98	93	75	89	88	68	84	90	62	77	83	71.9
24	98	81	0	97	79	50	89	57	86	86	52	78	79	36	62	101.1
25	79	88	8	78	73	14	60	63	32	56	54	21	41	50	27	46.9
26	71	78	78	60	55	68	51	31	61	40	28	50	37	13	48	37.0
27	78	45	29	60	26	16	46	21	18	41	4	11	35	5	2	45.0
Postrainy/Post-pluvieuse (37.1 mm)																
28	41	50	24	22	29	14	19	0	12	8	0	7	3	0	3	13.5
29	35	32	37	17	18	23	10	17	16	6	0	10	3	0	5	9.4
30	35	0	5	22	0	0	16	0	0	10	0	0	5	0	0	14.2

W = Wet; W+W = Wet followed by wet; W+D = Wet followed by dry.
H = Humide; H+H = Humide suivi par humide; H+S = Humide suivi par sec.

Yako (745 mm)

Decade	>10 mm			>20 mm			>30 mm			>40 mm			>50 mm			Mean/ Moyenne (mm)
	W H	W+W H+H	W+D H+S	W H	W+W H+H	W+D H+S	W H	W+W H+H	W+D H+S	W H	W+W H+H	W-K) H+S	W H	W+W H+H	W+D H+S	
Prerainy/Pre-pluvieuse (32.9 mm)																
12	27	40	41	11	75	12	5	0	9	3	0	3	3	0	0	9.3
13	41	47	36	19	14	20	8	0	12	3	0	8	0	0	5	10.8
14	41	60	64	19	43	43	11	25	36	8	33	26	5	0	20	12.7
Rainy/Pluvieuse (669.3 mm)																
15	62	70	79	43	63	48	35	46	29	27	40	22	19	14	13	24.4
16	73	78	60	54	55	35	35	38	42	27	10	30	14	20	19	26.2
17	73	93	90	46	94	85	41	60	73	24	56	50	19	14	30	28.9
18	92	94	100	89	85	100	68	76	83	51	58	61	27	50	33	40.5
19	95	94	50	86	91	80	78	86	88	59	73	53	38	71	52	47.2
20	92	100	100	89	100	100	86	91	100	65	83	62	59	82	47	56.5
21	100	97	0	100	86	0	92	76	100	76	71	56	68	64	33	79.9
22	97	100	0	86	94	80	78	90	75	68	80	75	54	80	76	67.1
23	97	100	100	92	94	100	86	91	100	78	79	75	78	72	75	79.6
24	100	97	0	95	86	100	92	74	0	78	52	50	73	37	50	81.7
25	97	97	0	86	94	80	68	76	67	51	63	61	41	47	36	57.3
26	95	71	100	92	50	100	73	33	30	62	26	21	41	13	9	49.9
27	73	41	30	54	30	18	32	17	16	24	11	7	11	0	6	30.2
Postrainy/Post-pluvieuse (28.4 mm)																
28	38	29	26	24	0	21	16	0	13	8	0	3	5	0	0	13.2
29	27	30	22	16	33	10	11	25	3	3	0	0	0	0	0	8.3
30	24	0	7	14	0	0	5	0	0	0	0	0	0	0	0	6.8

W = Wet; W+W = Wet followed by wet; W+D = Wet followed by dry.
H = Humide; H+H = Humide suivi par humide; H+S = Humide suivi par sec.

APPENDIX IV - Computer Program Used for Constant Probability Analysis

APPENDICE IV - Programme informatique utilise pour l'analyse de la probabilite constante

Computer program used for constant probability analysis/
Programme informatique utilisé pour l'analyse de la probabilité constante

```
1 SUB GAMMA
2  DIM #10%, D8$(1%),D9(1%),P(100%,53%),B(100%,13%),C(100%,36%), &
             R8(103%,37%),R1(103%,37%)
23 DIM #11%,DD$(53),AB(8),P90(50%),P75(50%),P50(50%),P25(50%), &
           P10(50%),MN(50%),G1$(32%),ZZ(6%),PP(37%),R(37,53), &
           P2(53),I1%(70),A(53),A1(53),G(53),R2(53),R3(53),   &
           L1(53),S6(37%),S7(37%)
45 OPEN "ZZ1.VIR" AS FILE #11%,VIRTUAL,TEMPORARY
46 MAT G=ZER
50 G2$="  "
52 G3$="------------------------------------------------------------------------"
53 DATA 13
54 DATA 5. , 10., 20.,25.,30.,40.,50.,60.,70.,75.,80.,90.,95.
55 DATA 1.64485,1.28155,.84162,.67448,.53440,.25300
56 DATA  -.577191652,.988205891,-.897056937,.918206857,-.756704073,.482189394,-.193527818,.035868343
60 READ N1%
61 FOR I% =1% TO N1%\ READ PP(I%)\ NEXT I%
62  N5%=N1%/2%\READ ZZ(I) FOR I = 1% TO N5%
63 MAT READ AB
80 ONERROR GO TO 30000
110 A$="  ####"
130 REM INCOMPLETE GAMMA
135 G9=1
140 FOR UI%=1 TO D9(1%)
142 FOR UJ%=1 TO 36
160 R1(UI%,UJ%)=C(UI%,UJ%)
161 NEXT UJ% \ NEXT UI%
165 FOR G8=1 TO G9
190 N4%=D9(1%)\R8(103%,37%)=0. ! PREALLOCATE TEMPORARY FILE
200 FOR I%=1% TO N4% \ FOR J%=1% TO 36% \ R8(I%,J%)=R1(I%,J%)\NEXT J% \ NEXT I%
211 IF G8>1 THEN 290
290 N6%=1
300 N2%=36
310 N3%=N2%
320 W1%=1\N2%=N2%/W1%\L%=N2%+1%
380 L8%=1
390 L7%=36
400 MAT P2=ZER \ MAT R=ZER
```

```
410 Y=N4%
420 L9%=2
440 IF L9%=1% THEN L7=0.1 ELSE L7=1.0
450 I% = INSTR(1%,F$,'.DAT')\ IF I% <>0 THEN 480
460 IF L9%=1% THEN L7=0.1 ELSE L7=1.0
478 PRINT #6%,'STATION:   ';D8$(1%);'                    DATA BASE: ';D9(1%);' YEARS'
479 PRINT #6%,'                                        BASE DE DONNEES: ';D9(1%);'ANS'
480 FOR M% = 1% TO N4%
490 IF W1%=1% THEN Y%=1% \ GOTO 520
500 Y%=0\FOR I1% = 1% TO N2%\W=0\FOR I2% = 1% TO W1%
510 Y%=Y%+1%\W=W+R8(M%,Y%)\NEXT I2%\R8(M%,I1%)=W\NEXT I1%
520 S1=0.\ FOR J% =1% TO N2%\ E9=R8(M%,J%) \ P2(J%)=P2(J%)+E9
530 S1=S1+E9\NEXT J%
540 R8(M%,L%) =S1\ P2(L%)= P2(L%) +S1
550 NEXT M%
560 P2(J%) = P2(J%)/Y FOR J% = 1% TO L%
590 X%=N1%+1%
720 FOR J%=1% TO L%
730 DD$(J%)=' ' \ A(J%)=P2(J%)+L7
740 R9=R8(1%,J%)
750 S2 =(R9 - A(J%))*(R9 - A(J%))\A2=LOG(R9+L7)
760 FOR I% = 2% TO N4%
770 R9=R8(I%,J%)
780 S2=S2+(R9 - A(J%))*(R9 - A(J%))\A2=A2+LOG(R9+L7)
790 NEXT I%\ A3=LOG(P2(J%)+L7)
800 A3=A3 - A2/Y
810 IF A3=0 THEN A3=0.1*L7
811 PRINT #6%,'L7: ';L7;'A3: ';A3;
820 P5=1./(4*A3)*(1+SQR(1+4*A3/3))\L1(J%) =P5
821 PRINT #6%,'P5: ';P5;
830 IF(A(J%) =0) THEN A(J%)=L7
840 A1(J%)=P5/A(J%)\P6=P5 -1
850 T9= SQR(S2/(Y -1))
852 S6(J%)=T9
853 S7(J%)=S6(J%)/A(J%)*100
854 IF J%<6 THEN 860
855 IF J%>8 THEN 860
856 GOTO 1120
860 IF P5 >= 85 THEN 1120
870 GOSUB 1400
880 G(J%)=H
890 G(J%)=LOG(G(J%))\ GOTO 920
```

```
900 GOTO 1160
910 G(J%)=2.302585*G(J%)
920 G6=G(J%)
921 PRINT #6%,'G6: ';G6;
930 FOR I7% = 1% TO N1%\ T2=0\T3=.0001\T5=.0004\X0=P6
931 PRINT #6%,'P6: ';P6;
940 IF P5<1 THEN 960
950 IF X0<= 0 THEN 970 ELSE 980
960 X0=.0001\GOTO 980
970 X0=.01
980 Z1=2\T2=T2+1\T1=X0/(P6+Z1)\S=T1+1
990 FOR L=1 TO 100
1000 Z1=Z1+1\T1=(T1*X0)/(P6+Z1)\S=S+T1
1010 IF T1 <= T3 THEN 1030
1020 NEXT L
1030 D6=PP(I7%)/100\IF D6 <0 THEN 1100
1040 R7=X0\IF X0 > 86 THEN 1120
1041 PRINT #6%,'R7: ';R7;
1050 R7=EXP(G6 -(P6*LOG(R7)))
1051 PRINT #6%,'R7: ';R7
1060 X1=X0 -(X0/P5)*S+(D6*R7*EXP(X0))
1070 D7=X1 - X0\X0=X1
1080 IF X0 < 0 THEN 1100 ELSE IF X0=0 THEN 1110
1090 IF ABS(D7)<=T5 THEN 1110
1091 IF T2<=100 THEN 980
1100 X1=0
1110 R3(I7%)=X1/A1(J%)\NEXT I7%\GOTO 1160
1120 FOR I = 1 TO N5%\F1=T9*ZZ(I)\R3(I)=A(J%)- F1\ R3(X% - I)=A(J%)+F1\IF R3(I) < 0 THEN R3(I) =0
1130 IF R3(X%+1%) <0 THEN R3(X%+1%)=0
1140 NEXT I
1150 R3(N5%+1)=P2(J%)\DD$(J%)=' '
1160 FOR I = 1 TO N1%\R(I,J%)=R3(I)\NEXT I\NEXT J%
1200 FOR J%=1 TO L%
1201 MN(J%)=P2(J%)
1202 P90(J%)=R(2,J%) \ P75(J%)=R(4,J%) \ P50(J%)=R(7,J%) \ P25(J%)=R(10,J%)
1203 P10(J%)=R(12,J%)
1210 NEXT J%
1300 GOSUB 1800
1390 GOTO 1565
1400 C=.43429482\IF ABS(P5) <33 GOTO 1420
1410 H=(P5 -.5)*C*LOG(ABS(P5))- C*P5+.39908995+C*LOG(1+1/(12*P5)+1/(288*P5*P5)-138/(51840*P5*P5*P5))\GOTO 910
1420 F1=1\F2=P5 -1\ IF F2<0 GOTO 1450
```

```
1430 IF F2 <1 GOTO 1480 ELSE F1=F1*F2
1440 F2=F2 -1\ GOTO 1430
1450 F2=F2+1\F1=F1*F2
1460 IF F2<0 GOTO 1450 ELSE IF F2=0 GOTO 900
1470 F1=1/F1
1480 H=0\ J9=9 \ FOR I = 1 TO 8\ J9=J9 -2\M=I+J9\ H=(H+AB(M))*F2\NEXT I
1490 H=(1+H)*F1\ RETURN
1565 NEXT G8
1566 PRINT #6%,CHR$(12%) \ GOTO 32000
1800 ! SUBROUTINE FOR TABLE PRINTTING
1805 PRINT #6%, G3$
1810 PRINT #6%,'                    PROBABILITY LEVELS (%)                    MEAN/'
1815 PRINT #6%,'DECADE              NIVEAUX DE PROBABILITE(%)                 MOYENNE'
1820 PRINT #6%,'           ------------------------------------------     '
1830 PRINT #6%,'                  90       75       50       25       10      (mm)    '
1900 G4$="                                                  "
2005 L1$='#####  ' \ V1$="  ##"
2007 PRINT #6%, G3$ \ L%=0
2008 FOR H8%=1 TO 37
2009 IF H8%=37 THEN GOTO 2011
2010 IF MN(H8%)<5 THEN GOTO 2469
2011 IF H8%=37 THEN PRINT #6%, G3$
2012 IF H8%=37 THEN PRINT #6%,'TOTAL          '; \ GOTO 2105
2013 IF L%=0 THEN GOTO 2100
2015 IF L%>35 THEN GOTO 2100
2016 IF (L%/4%*4%-L%)=0 THEN PRINT #6%
2100 PRINT #6% USING V1$,H8%;\PRINT #6%,'           ' ;
2105 PRINT #6% USING L1$,P90(H8%);
2110 PRINT #6%, G2$;
2115 PRINT #6% USING L1$,P75(H8%);
2120 PRINT #6%, G2$;
2125 PRINT #6% USING L1$,P50(H8%);
2130 PRINT #6%, G2$;
2135 PRINT #6% USING L1$,P25(H8%);
2140 PRINT #6%, G2$;
2145 PRINT #6% USING L1$,P10(H8%);
2148 PRINT #6%, G2$;
2150 PRINT #6% USING L1$,MN(H8%)
2370 IF H8%>36 THEN GOTO 2375 ELSE 2460
2375 PRINT #6%, G3$
2460 IF H8%>34 THEN GOTO 2469
2462 L%=L%+1%
```

```
2469 NEXT H8%
2480 RETURN
30000  !ERROR PROCESSING
30010 PRINT ERR,ERL
30015 PRINT ERT$(ERR)
30020 RESUME 32000
32000   CLOSE #11%
32767 SUBEND
>
```

APPENDIX V - Results of the Constant Probability Analysis

APPENDICE V - Resultats de l'analyse de la probabilite constante

Bam

Decade	Probability levels (%)/ Niveaux de probabilite (%)					Mean/ Moyenne (mm)
	90	75	50	25	10	
	Rainfall/Pluviometrie (mm)					
12	0.2	1.0	4.6	13.4	27.4	9.1
13	0.6	2.0	5.5	11.9	20.7	7.6
14	0.9	2.4	6.0	12.1	20.3	7.8
15	5.0	9.8	18.3	30.8	45.8	21.6
16	3.1	7.5	16.4	30.9	49.4	21.3
17	7.5	14.2	25.9	42.9	63.2	30.6
18	13.5	22.4	36.4	55.3	77.1	40.8
19	9.4	18.0	33.1	55.1	81.5	39.6
20	7.8	17.4	36.1	65.2	101.9	46.4
21	20.5	35.3	59.0	91.8	129.8	67.8
22	23.0	38.4	62.9	96.2	134.5	71.5
23	26.4	40.5	61.4	88.5	118.8	67.2
24	24.3	40.5	66.0	100.7	140.6	75.0
25	9.1	18.7	36.2	62.5	94.9	44.7
26	5.3	13.0	29.0	55.1	88.8	38.9
27	3.7	8.0	16.2	28.8	44.5	20.0
28	1.2	3.4	8.5	17.5	29.5	11.6
TOTAL	497.7	560.3	635.9	718.0	797.6	642.0

Banfora

Decade	Probability levels (%)/ Niveaux de probabilite *(%)*					Mean/ Moyenne (mm)
	90	75	50	25	10	
	Rainfall/Pluviometrie (mm)					
8	0.0	0.0	5.1	13.2	19.7	5.1
9	0.4	1.8	6.2	15.2	28.5	10.1
10	0.9	3.1	8.7	19.1	33.5	12.8
11	1.0	4.2	13.2	31.4	57.5	21.9
12	3.6	9.0	20.1	38.5	62.1	26.8
13	3.0	8.7	22.2	45.9	77.9	32.1
14	3.4	8.8	20.6	40.4	66.3	28.1
15	9.2	19.5	38.7	68.0	104.2	48.6
16	10.5	19.9	35.9	59.1	86.8	42.6
17	13.0	24.0	42.4	68.6	99.8	49.8
18	12.0	22.1	39.1	63.5	92.4	46.0
19	13.7	25.3	45.1	73.4	107.1	53.3
20	20.9	36.2	61.0	95.5	135.5	70.4
21	26.3	43.8	71.5	109.1	152.3	81.3
22	21.2	41.3	76.9	129.1	192.1	93.8
23	25.6	46.5	81.4	130.9	189.5	96.2
24	26.5	49.3	88.2	144.0	210.5	105.5
25	30.0	47.3	73.7	108.5	147.8	81.9
26	19.5	33.5	56.0	87.1	123.2	64.3
27	12.2	24.4	46.1	78.5	117.8	56.5
28	8.0	16.0	30.2	51.2	76.8	36.5
29	1.3	4.3	11.9	26.2	46.1	18.0
30	1.1	3.8	11.0	24.8	44.2	17.0
31	0.3	1.4	5.3	13.7	26.5	9.2
32	0.2	1.0	4.0	10.9	21.7	7.2
TOTAL	722.0	887.1	1098.8	1341.8	1588.6	1132.1

Batie

Decade	Probability levels (%)/ Niveaux de probabilite (%)					Mean/ Moyenne (mm)
	90	75	50	25	10	
	Rainfall/Pluviometrie (mm)					
5	0.1	0.8	3.2	8.8	17.6	5.6
6	0.0	0.0	5.9	16.9	26.0	5.9
7	0.0	0.0	5.2	12.6	18.4	5.2
8	0.0	2.1	11.5	22.9	32.2	11.5
9	1.2	4.7	14.5	34.2	62.3	23.9
10	0.9	3.4	10.7	25.4	46.5	17.5
11	2.4	7.2	18.9	39.8	68.1	27.7
12	5.1	12.1	26.2	48.8	77.7	34.3
13	7.6	15.4	29.6	50.8	76.8	36.2
14	12.2	22.5	39.9	64.6	94.0	46.9
15	10.2	19.6	35.9	59.5	87.9	42.8
16	11.0	19.9	34.8	56.0	80.9	40.6
17	8.6	18.9	38.7	69.4	107.8	49.5
18	15.3	25.7	42.2	64.7	90.6	47.7
19	9.1	19.3	38.2	67.2	103.0	48.0
20	12.3	24.2	45.2	76.2	113.7	54.9
21	10.4	23.2	47.9	86.6	135.2	61.9
22	17.2	31.6	56.0	90.7	131.8	66.2
23	13.6	27.6	52.9	90.8	137.1	65.4
24	32.1	50.0	77.2	112.8	152.8	85.4
25	41.8	62.3	92.3	130.7	173.2	100.5
26	31.6	48.8	74.7	108.6	146.5	82.4
27	22.5	35.5	55.3	81.5	111.0	61.2
28	11.0	21.2	38.9	64.6	95.6	46.6
29	2.5	8.3	22.9	49.8	86.9	35.0
30	1.1	4.8	16.2	40.1	75.3	28.4
31	0.6	2.3	7.0	16.4	29.9	10.9
TOTAL	848.6	981.3	1144.5	1324.8	1502.3	1162.3

Bobo-Dioulasso

Decade	Probability levels (%) / Niveaux de probabilite *(%)*					Mean/ Moyenne (mm)
	90	75	50	25	10	
	Rainfall / Pluviometrie (mm)					
8	0.0	0.0	7.7	25.7	41.0	7.7
9	0.4	1.7	5.9	14.8	28.1	9.9
10	0.4	1.7	5.2	12.2	22.1	7.8
11	1.0	3.5	10.1	22.5	39.7	15.3
12	2.5	6.7	16.3	32.8	54.5	22.6
13	2.4	7.5	19.8	42.1	72.5	29.4
14	3.5	9.0	20.9	40.8	66.8	28.5
15	7.5	17.3	36.6	67.1	105.7	47.6
16	6.0	13.7	29.0	53.2	83.9	37.6
17	9.9	19.5	36.5	61.5	91.8	44.1
18	11.1	20.7	37.1	60.7	88.9	43.9
19	13.5	25.6	46.4	76.4	112.4	55.4
20	13.7	28.9	57.2	100.1	153.2	72.0
21	17.8	35.0	65.4	110.2	164.4	79.9
22	17.6	35.6	68.1	116.6	175.9	84.4
23	18.8	39.3	77.2	134.8	205.7	97.3
24	21.9	43.9	83.2	141.7	212.8	102.8
25	19.8	37.6	68.2	112.5	165.5	82.0
26	15.5	29.9	55.1	92.0	136.4	66.7
27	9.9	19.5	36.4	61.3	91.5	44.0
28	2.6	7.6	19.3	39.7	67.2	27.7
29	1.7	5.3	14.1	30.2	52.2	20.8
30	0.8	3.2	10.4	25.1	46.5	17.3
31	0.3	1.2	4.2	10.8	20.5	6.9
TOTAL	605.6	782.7	1017.8	1296.0	1585.4	1064.0

Bogande

Decade	Probability levels (%) / Niveaux de probabilite (%)					Mean/ Moyenne (mm)
	90	75	50	25	10	
	Rainfall/Pluviometrie (mm)					
12	0.1	1.0	4.6	13.6	28.2	9.3
13	0.6	2.4	7.2	16.6	30.1	11.1
14	0.8	3.1	9.2	21.0	37.7	14.2
15	2.4	7.5	19.9	42.2	72.6	29.4
16	2.1	5.9	14.5	29.3	49.0	20.1
17	4.3	9.9	20.9	38.3	60.4	26.8
18	6.6	14.2	28.5	50.3	77.5	35.6
19	9.0	17.1	31.1	51.5	75.8	37.0
20	13.1	23.7	41.7	67.1	97.2	48.8
21	15.5	29.6	54.0	89.6	132.3	65.0
22	14.5	26.8	47.7	77.7	113.4	56.5
23	13.9	28.1	53.7	92.1	139.0	66.4
24	11.7	25.4	51.1	90.8	140.2	65.1
25	12.7	24.3	44.4	73.6	108.6	53.2
26	4.1	11.0	26.0	51.3	84.7	36.0
27	2.0	6.3	16.6	35.2	60.6	24.4
28	0.4	1.9	6.6	16.5	31.2	11.1
29	0.4	1.5	4.7	11.2	20.6	7.2
30	0.2	0.9	3.5	9.4	18.2	5.9
TOTAL	231.3	363.4	563.6	827.5	1124.6	631.9

Boromo

Decade	Probability levels (%)/ Niveaux de probabilite (%)					Mean/ Moyenne (mm)
	90	75	50	25	10	
	----------Rainfall/Pluviometrie(mm) ———					
10	0.4	1.4	4.2	9.3	16.6	5.8
11	0.6	2.1	6.3	14.5	26.1	9.5
12	0.9	3.4	10.5	24.8	45.3	17.1
13	2.5	6.9	16.7	33.7	56.2	23.3
14	3.6	9.1	20.6	39.6	64.2	27.6
15	6.3	14.2	29.6	53.6	83.9	37.9
16	9.3	17.1	30.4	49.4	71.9	35.5
17	9.6	18.4	33.8	56.2	83.1	40.4
18	11.4	20.9	36.8	59.5	86.4	43.1
19	12.0	23.4	43.5	73.1	108.8	52.7
20	16.7	32.3	59.5	99.3	147.3	72.1
21	23.9	39.2	63.0	95.0	131.7	70.9
22	26.0	43.3	70.6	107.6	150.1	80.2
23	26.5	45.9	77.3	120.9	171.5	89.5
24	37.7	58.3	89.2	129.5	174.7	98.5
25	26.3	42.3	67.0	99.9	137.2	74.9
26	15.7	28.4	49.9	80.3	116.2	58.6
27	7.3	16.1	32.8	58.8	91.2	41.7
28	1.8	5.8	15.5	33.2	57.4	23.0
29	0.9	3.3	9.4	21.2	37.7	14.4
30	0.3	1.7	6.0	15.3	29.2	10.2
31	0.2	0.9	3.6	9.8	19.4	6.3
TOTAL	599.1	739.3	919.6	1127.1	1338.2	948.4

Dedougou

Decade	Probability levels (%) / Niveaux de probabilite (%)					Mean/ Moyenne (mm)
	90	75	50	25	10	
	Rainfall/Pluviometrie (mm)					
11	0.2	1.3	4.8	12.8	24.9	8.5
12	0.4	2.0	7.8	20.7	40.3	14.3
13	0.9	3.7	12.0	28.9	53.5	20.1
14	1.4	4.1	10.6	22.2	37.8	15.0
15	4.4	10.9	24.7	47.4	76.8	33.3
16	7.0	14.1	26.8	45.7	68.9	32.5
17	7.1	15.7	32.2	57.9	90.2	41.1
18	14.8	24.0	38.4	57.7	79.7	42.7
19	15.1	28.0	49.9	81.3	118.6	59.2
20	17.7	31.3	53.6	84.8	121.3	62.2
21	35.3	53.6	80.7	115.9	155.0	88.5
22	35.9	52.5	76.6	107.2	140.7	82.7
23	30.1	51.0	84.3	130.0	182.8	96.7
24	37.1	54.5	79.7	111.8	147.0	86.2
25	20.5	35.2	59.0	91.8	129.8	67.8
26	14.3	26.2	46.3	74.9	108.9	54.5
27	3.7	10.4	25.8	52.5	88.0	36.8
28	2.8	7.5	18.2	36.4	60.4	25.2
29	1.1	3.7	10.3	22.8	40.1	15.5
30	0.3	1.4	5.2	13.6	26.4	9.1
TOTAL	671.3	771.9	895.0	1030.7	1163.8	907.7

Diapaga

Decade	Probability levels (%) / Niveaux de probabilite *(%)*					Mean/ Moyenne (mm)
	90	75	50	25	10	
	Rainfall/Pluviometrie (mm)					
11	0.2	1.3	5.2	14.0	27.5	9.4
12	1.1	3.5	9.3	20.1	34.8	13.5
13	1.2	4.5	13.9	32.6	59.4	22.7
14	2.3	6.3	15.0	30.0	49.7	20.6
15	8.0	16.3	31.4	54.1	81.9	38.6
16	9.3	17.6	32.1	53.1	78.3	38.1
17	11.3	18.8	30.8	47.1	65.9	34.5
18	9.0	18.3	34.9	59.8	90.1	42.8
19	11.4	21.4	38.5	63.1	92.6	45.6
20	18.4	30.9	50.9	78.2	109.6	57.8
21	21.1	36.1	60.4	93.8	132.6	69.3
22	20.2	36.8	64.8	104.6	151.7	76.6
23	38.3	55.4	79.7	110.5	144.0	85.7
24	35.3	52.6	77.8	110.1	145.8	84.5
25	33.4	47.4	67.1	91.7	118.4	71.4
26	21.6	33.2	50.5	72.9	98.0	55.1
27	4.6	11.2	24.4	45.7	73.0	32.1
28	0.7	2.7	8.6	20.5	37.7	13.9
29	0.5	1.7	5.0	11.1	19.6	7.0
30	0.2	1.1	5.0	14.3	28.9	9.8
TOTAL	646.7	732.0	835.3	947.8	1057.3	844.5

Diebougou

Decade	Probability levels (%) / Niveaux de probabilite (%)					Mean/ Moyenne (mm)
	90	75	50	25	10	
	Rainfall/Pluviometrie (mm)					
8	0.0	0.0	6.2	18.8	29.2	6.2
9	0.5	2.0	6.5	15.6	28.8	10.4
10	0.3	1.4	5.0	12.6	23.9	8.3
11	0.6	2.7	9.0	21.9	40.8	15.0
12	2.0	6.5	17.8	38.5	67.0	26.8
13	1.6	5.5	15.9	35.9	63.9	25.0
14	3.7	10.6	26.3	53.7	90.4	37.8
15	8.5	17.9	35.3	61.7	94.3	44.0
16	9.6	19.3	36.7	62.7	94.4	44.9
17	16.0	27.1	44.7	68.8	96.6	50.7
18	18.6	30.5	49.1	74.2	102.9	55.2
19	10.3	20.5	38.8	65.8	98.7	47.3
20	22.7	38.2	62.7	96.1	134.7	71.4
21	21.0	35.2	57.7	88.4	123.7	65.6
22	23.4	41.0	69.8	109.9	156.8	81.0
23	24.4	42.0	70.2	109.1	154.4	80.8
24	27.4	47.4	79.8	124.8	177.1	92.4
25	17.8	35.7	67.8	115.6	173.8	83.7
26	14.9	30.0	57.0	97.3	146.3	70.2
27	6.4	14.9	31.7	58.5	92.5	41.4
28	3.8	9.7	22.4	43.4	70.8	30.3
29	1.3	4.2	11.8	25.8	45.2	17.7
30	0.6	2.5	8.5	20.9	39.0	14.3
31	0.2	1.2	4.3	11.3	21.8	7.3
TOTAL	741.3	867.5	1023.9	1198.1	1370.7	1042.5

Djibo

Decade	Probability levels (%) / Niveaux de probabilite (%)					Mean/ Moyenne (mm)
	90	75	50	25	10	
	Rainfall/Pluviometrie (mm)					
13	0.2	1.0	3.4	8.5	16.2	5.3
14	0.4	1.4	4.3	10.0	18.2	6.3
15	0.6	2.2	6.9	16.1	29.3	10.7
16	0.7	2.7	7.8	17.7	31.7	11.8
17	1.7	4.6	11.0	21.9	36.2	14.8
18	1.8	6.4	19.0	43.1	77.2	30.3
19	3.6	9.2	20.8	40.1	65.1	28.0
20	7.8	17.7	37.3	68.2	107.2	48.4
21	8.6	18.7	37.9	67.7	104.8	48.2
22	19.4	31.3	49.8	74.5	102.6	55.6
23	14.9	26.8	46.8	75.0	108.4	54.7
24	18.8	34.2	60.2	97.1	140.8	71.1
25	6.7	14.9	30.6	55.3	86.2	39.1
26	6.5	14.0	27.8	49.0	75.3	34.7
27	0.7	2.8	8.8	20.7	37.8	14.1
28	0.4	1.9	7.0	18.4	35.5	12.6
29	0.2	1.4	5.5	15.1	30.0	10.3
TOTAL	317.5	393.8	492.2	605.9	721.9	507.9

Dori

Decade	Probability levels (%) / Niveaux de probabilite (%)					Mean/ Moyenne (mm)
	90	75	50	25	10	
	Rainfall / Pluviometrie (mm)					
14	0.6	2.0	5.8	12.9	22.9	8.4
15	0.9	2.9	8.1	17.6	30.7	11.7
16	1.4	4.0	10.2	21.0	35.4	14.1
17	1.9	5.4	13.6	27.9	47.1	19.1
18	4.6	10.5	22.2	40.5	63.7	28.4
19	7.2	14.9	29.3	51.0	77.8	36.2
20	6.2	14.2	29.9	54.8	86.3	38.7
21	14.8	27.0	47.7	77.0	111.8	56.1
22	8.6	19.6	41.2	75.1	117.9	53.5
23	12.8	25.5	48.1	81.7	122.5	58.9
24	12.9	25.8	48.8	83.0	124.5	59.8
25	4.5	11.0	24.3	45.9	73.6	32.2
26	2.3	7.4	20.0	43.1	74.7	30.1
27	1.4	4.9	14.3	32.2	57.3	22.3
28	0.4	1.4	4.4	10.3	18.8	6.5
29	0.2	1.0	3.5	8.7	16.6	5.4
TOTAL	232.5	328.1	462.8	630.5	811.6	497.8

Decade	Probability levels (%) / Niveaux de probabilite (%)					Mean/ Moyenne (mm)
	90	75	50	25	10	
	Rainfall/Pluviometrie (mm)					
9	0.3	1.2	3.8	8.7	15.8	5.3
10	0.3	1.1	3.7	9.1	17.1	5.7
11	0.5	1.6	4.4	9.6	16.7	5.9
12	1.1	3.5	9.2	19.6	33.9	13.2
13	2.4	6.3	14.7	28.7	47.0	19.7
14	2.4	7.0	17.6	36.3	61.2	25.2
15	6.6	13.9	27.5	48.3	73.8	34.2
16	9.4	17.3	30.6	49.5	72.0	35.7
17	14.2	24.3	40.4	62.7	88.4	46.0
18	9.8	18.8	34.4	57.2	84.6	41.1
19	11.5	21.7	39.3	64.8	95.3	46.8
20	13.8	27.1	50.6	85.1	126.8	61.5
21	21.4	37.0	62.3	97.2	137.9	71.8
22	25.4	42.5	69.6	106.5	149.0	79.3
23	37.1	55.8	83.1	118.3	157.3	90.7
24	34.8	50.7	73.5	102.3	133.9	79.1
25	22.2	37.9	63.0	97.4	137.3	72.1
26	12.6	24.1	44.2	73.5	108.7	53.1
27	5.0	11.7	24.8	45.7	72.2	32.1
28	1.2	3.6	9.5	19.9	34.1	13.4
29	0.3	1.4	4.9	12.5	23.6	8.2
30	0.2	1.2	4.4	11.5	22.4	7.6
TOTAL	643.1	733.4	843.2	963.5	1081.1	853.7

Gaoua

Decade	Probability levels (%) / Niveaux de probabilite (%)					Mean/ Moyenne (mm)
	90	75	50	25	10	
	Rainfall/Pluviometrie (mm)					
8	0.0	0.0	9.9	22.5	32.9	9.9
9	0.7	2.9	10.1	25.3	47.8	17.6
10	0.7	3.3	11.6	29.2	55.4	20.4
11	2.2	6.8	17.8	37.6	64.5	26.1
12	4.2	10.5	23.4	44.5	71.8	31.2
13	6.3	15.0	32.6	60.8	96.8	43.0
14	10.0	18.9	34.4	56.6	83.3	40.8
15	14.5	26.8	47.6	77.4	112.9	56.3
16	17.0	27.5	43.8	65.7	90.5	48.8
17	22.1	33.6	50.7	73.0	97.7	55.3
18	15.2	26.6	45.0	70.7	100.6	51.8
19	14.0	27.4	50.8	85.2	126.8	61.7
20	15.4	30.6	57.8	98.1	147.1	70.9
21	17.6	33.5	61.1	101.1	149.1	73.5
22	15.9	32.4	62.3	107.0	161.6	77.3
23	20.2	39.2	72.5	121.2	179.9	88.1
24	21.9	41.4	74.8	123.0	180.7	89.8
25	29.2	47.3	75.4	113.0	155.8	84.7
26	22.5	38.9	65.3	102.0	144.6	75.3
27	18.3	32.0	54.3	85.2	121.4	62.7
28	7.3	15.2	29.9	52.1	79.5	37.0
29	2.4	7.3	18.7	38.9	66.2	27.1
30	1.7	5.8	16.4	36.4	64.3	25.4
31	0.4	1.9	6.8	17.0	32.3	11.5
32	0.1	0.9	3.7	10.6	21.3	6.9
TOTAL	810.4	975.3	1183.8	1420.0	1657.5	1213.3

Garango

Decade	Probability levels (%) / Niveaux de probabilite (%)					Mean/ Moyenne (mm)
	90	75	50	25	10	
	Rainfall/Pluviometrie (mm)					
9	0.2	0.9	3.6	9.7	18.9	6.2
10	0.2	0.9	3.4	9.2	17.9	5.8
11	0.2	1.2	4.4	11.6	22.5	7.6
12	0.4	2.0	7.7	20.3	39.6	14.1
13	1.4	5.2	15.9	36.9	66.8	25.8
14	1.3	4.7	14.3	33.0	59.7	23.0
15	3.9	10.4	24.9	49.3	81.6	34.6
16	4.4	9.7	19.8	35.4	54.9	24.7
17	9.9	17.8	31.0	49.5	71.4	35.8
18	4.6	12.0	27.9	54.7	89.6	38.4
19	10.7	22.0	42.6	73.7	111.8	52.8
20	25.5	39.7	61.0	88.9	120.2	67.2
21	17.3	31.3	54.7	87.7	126.7	64.1
22	31.8	48.7	73.8	106.5	143.0	81.1
23	37.0	55.3	82.1	116.5	154.4	89.4
24	27.7	45.5	73.3	110.9	153.9	82.9
25	24.2	40.2	65.2	99.2	138.2	73.9
26	15.5	28.6	51.0	83.0	121.1	60.4
27	4.0	9.8	21.9	41.6	67.0	29.1
28	0.8	3.4	11.2	27.2	50.4	18.8
29	0.5	2.3	7.5	18.3	34.0	12.4
30	0.2	1.2	4.9	13.2	25.9	8.8
TOTAL	0.0	0.0	0.0	0.0	0.0	870.5

Hounde

Decade	Probability levels (%) / Niveaux de probabilite (%)					Mean/ Moyenne (mm)
	90	75	50	25	10	
	Rainfall/Pluviometrie (mm)					
9	0.2	1.0	3.3	8.3	15.5	5.1
10	0.2	1.2	4.8	12.7	24.9	8.5
11	0.4	2.1	7.7	19.9	38.2	13.7
12	1.2	4.0	11.3	25.0	44.1	17.1
13	1.5	5.0	13.9	30.2	52.9	20.9
14	2.9	8.2	20.1	40.7	68.0	28.3
15	4.7	12.3	28.6	56.1	91.9	39.5
16	6.8	14.6	29.0	51.2	78.6	36.3
17	8.2	17.3	34.1	59.8	91.6	42.6
18	8.7	18.3	36.0	62.9	96.1	44.9
19	14.6	27.0	48.0	78.1	113.9	56.8
20	15.7	28.4	49.7	79.9	115.6	58.3
21	23.5	40.6	68.3	106.6	151.1	78.8
22	23.8	42.4	73.2	116.4	167.2	85.7
23	23.4	40.4	68.0	106.1	150.4	78.4
24	22.2	41.6	75.0	123.1	180.5	89.9
25	18.7	35.9	65.7	109.1	161.2	79.4
26	12.5	25.4	48.7	83.6	126.3	60.2
27	8.5	18.0	35.7	62.8	96.3	44.8
28	2.3	6.9	18.1	37.9	64.8	26.4
29	1.0	3.5	10.4	23.7	42.4	16.2
30	0.5	*2.2*	7.9	20.0	38.0	13.7
31	0.2	0.9	3.9	11.0	22.1	7.3
TOTAL	436.6	624.9	892.8	1228.9	1594.0	966.1

Decade	Probability levels (%) / Niveaux de probabilite (%)					Mean/ Moyenne (mm)
	90	75	50	25	10	
	Rainfall / Pluviometrie (mm)					
11	0.4	1.3	3.7	8.5	15.2	5.2
12	0.6	2.2	6.5	14.8	26.4	9.7
13	1.0	4.0	13.0	31.3	57.9	21.9
14	3.3	7.1	14.2	25.1	38.6	17.3
15	4.6	10.1	20.7	37.1	57.7	26.0
16	9.7	17.2	29.5	46.9	67.3	33.9
17	6.8	15.9	34.2	63.4	100.7	44.9
18	7.0	14.9	29.5	51.8	79.4	36.8
19	16.6	27.2	43.8	66.2	91.8	49.1
20	19.2	32.4	53.5	82.2	115.4	60.8
21	20.2	35.9	62.0	98.6	141.7	72.4
22	30.7	44.6	64.4	89.5	116.9	69.1
23	23.1	42.1	74.0	119.3	172.9	87.5
24	30.4	46.1	69.5	99.8	133.4	76.0
25	18.8	31.2	50.7	77.2	107.6	57.3
26	16.4	27.7	45.8	70.5	99.0	52.0
27	5.3	10.9	21.1	36.4	55.2	25.6
28	0.5	2.2	7.1	17.3	32.1	11.6
29	0.2	1.1	4.3	11.7	23.2	7.7
30	0.2	1.0	4.0	11.1	22.1	7.3
TOTAL	613.9	687.2	775.2	870.5	962.6	782.1

Kaya

Decade	Probability levels (%) / Niveaux de probabilite (%)					Mean/ Moyenne (mm)
	90	75	50	25	10	
	----------Rainfall/Pluviometrie(mm)----------					
13	0.5	2.0	6.1	14.4	26.3	9.5
14	0.7	2.5	7.8	18.4	33.5	12.4
15	2.3	6.7	16.9	34.6	58.3	23.9
16	6.1	12.8	25.0	43.6	66.5	30.8
17	5.1	11.5	24.2	44.2	69.5	31.1
18	6.7	14.2	28.2	49.7	76.3	35.2
19	14.2	24.2	40.4	62.6	88.4	46.0
20	7.5	17.1	36.0	65.6	103.1	46.6
21	20.0	34.3	57.2	88.9	125.5	65.6
22	20.6	36.5	62.8	99.7	142.9	73.3
23	28.7	46.0	72.6	107.9	148.0	81.1
24	21.7	37.3	62.3	96.7	136.7	71.5
25	15.8	27.4	46.2	72.3	102.7	53.1
26	9.4	18.6	34.9	59.0	88.2	42.3
27	2.6	7.2	17.8	36.0	60.4	25.0
28	0.6	2.4	7.2	16.5	29.9	11.0
29	0.4	1.5	5.2	12.9	24.1	8.4
30	0.2	1.0	3.7	9.8	19.0	6.3
TOTAL	501.6	580.9	678.6	786.6	893.0	689.0

Koudougou

Decade	Probability levels (%) / Niveaux de probabilite (%)					Mean/ Moyenne (mm)
	90	75	50	25	10	
	----------Rainfall/Pluviometrie(mm)----------					
9	0.2	0.9	3.2	8.4	16.1	5.2
11	0.4	1.5	4.2	9.6	17.1	6.0
12	0.6	2.4	7.3	17.0	30.9	11.4
13	0.7	2.6	8.0	18.5	33.3	12.4
14	1.5	4.4	11.4	23.7	40.4	16.1
15	4.2	10.7	24.1	46.3	75.0	32.5
16	5.9	12.5	24.8	43.4	66.5	30.7
17	5.9	13.3	27.6	50.1	78.3	35.3
18	7.2	15.6	31.6	56.1	86.7	39.9
19	10.8	20.5	37.2	61.4	90.4	44.3
20	16.8	29.4	49.9	78.5	111.9	57.6
21	20.4	35.9	61.1	96.4	137.6	70.9
22	16.5	32.3	60.1	101.1	150.6	73.3
23	18.0	35.3	66.0	111.0	165.5	80.5
24	22.1	41.9	75.9	125.1	183.9	91.3
25	29.0	42.7	62.7	88.1	116.1	67.7
26	17.4	30.3	51.3	80.4	114.4	59.1
27	6.3	13.8	28.2	50.3	78.0	35.6
28	2.4	6.4	15.4	30.7	50.8	21.1
29	0.8	3.1	9.7	22.6	41.2	15.5
30	0.3	1.4	4.8	12.2	23.1	7.9
TOTAL	574.3	678.9	809.6	956.0	1101.8	825.9

Koupela

Decade	Probability levels (%) / Niveaux de probabilite (%)					Mean/ Moyenne (mm)
	90	75	50	25	10	
	---------Rainfall / Pluviometrie (mm)---------					
11	0.3	1.3	4.1	9.9	18.3	6.2
12	0.6	2.5	8.1	19.8	36.7	13.4
13	1.4	4.7	13.3	29.6	52.2	20.4
14	2.8	7.9	19.6	39.9	67.1	27.8
15	4.4	10.3	22.0	40.8	64.6	28.5
16	4.5	10.8	23.3	43.4	69.0	30.4
17	9.9	18.1	31.7	51.0	73.9	36.9
18	9.3	18.1	33.5	56.0	83.2	40.2
19	14.7	24.6	40.2	61.5	86.0	45.3
20	22.9	34.5	51.5	73.5	97.9	55.9
21	26.4	40.0	60.1	86.1	115.0	65.5
22	32.1	48.7	73.3	105.1	140.5	80.2
23	31.4	50.4	79.6	118.5	162.7	89.1
24	31.0	47.3	71.3	102.6	137.3	78.1
25	25.1	40.0	62.7	92.7	126.8	69.7
26	13.2	24.8	44.5	73.0	107.0	52.9
27	5.2	11.5	23.7	42.7	66.6	30.0
28	0.9	3.4	10.4	24.2	44.0	16.6
29	0.4	1.8	6.1	15.3	28.8	10.2
30	0.2	1.1	4.2	11.2	21.8	7.3
TOTAL	632.3	713.9	812.6	920.0	1024.3	821.1

Decade	Probability levels (%)/ Niveaux de probabilite (%)					Mean/ Moyenne (mm)
	90	75	50	25	10	
	Rainfall / Pluviometrie (mm)					
9	0.4	1.8	6.1	15.0	28.0	10.0
10	0.5	1.9	6.0	14.4	26.7	9.5
11	1.3	4.4	12.8	28.7	50.9	19.8
12	1.2	4.6	14.0	32.4	58.4	22.5
13	2.3	6.5	16.1	32.9	55.3	22.7
14	3.0	8.5	21.2	43.5	73.2	30.4
15	12.6	22.1	37.5	59.0	84.1	43.0
16	5.8	13.1	27.4	49.8	78.1	35.1
17	11.9	22.1	39.4	64.2	93.7	46.5
18	10.6	19.9	35.9	58.9	86.5	42.5
19	9.0	18.6	36.4	63.3	96.3	45.2
20	13.5	27.5	52.6	90.2	136.2	65.0
21	14.2	29.1	55.9	96.2	145.5	69.4
22	16.2	31.7	59.3	100.0	149.1	72.4
23	23.3	40.8	69.5	109.5	156.2	80.7
24	26.1	45.3	76.5	119.7	170.0	88.5
25	21.1	37.4	64.3	102.1	146.4	75.1
26	16.1	30.1	54.1	88.7	130.0	64.5
27	9.5	19.2	36.7	62.7	94.5	44.9
28	2.3	6.9	17.4	35.8	60.6	24.8
29	0.9	3.3	10.1	23.5	42.6	16.1
30	0.5	2.0	6.8	17.0	32.0	11.5
TOTAL	607.4	749.1	931.2	1140.8	1354.1	960.3

Manga

Decade	Probability levels (%) / Niveaux de probabilite (%)					Mean/ Moyenne (mm)
	90	75	50	25	10	
	Rainfall / Pluviometrie (mm)					
9	0.5	2.0	6.2	14.7	26.8	9.7
10	0.5	1.6	4.5	9.9	17.4	6.2
11	0.5	*2.2*	7.3	18.0	33.7	12.2
12	1.1	3.8	11.0	24.9	44.3	17.0
13	2.5	7.1	17.6	35.9	60.4	24.9
14	5.8	12.0	23.5	40.8	62.2	28.8
15	13.6	21.7	34.0	50.3	68.8	37.4
16	6.8	14.0	27.1	46.9	71.2	33.3
17	15.1	23.4	35.9	52.2	70.5	39.1
18	9.8	18.6	33.7	55.4	81.5	39.9
19	13.4	23.0	38.6	60.2	85.2	44.1
20	13.5	26.7	49.9	84.1	125.6	60.8
21	23.3	38.1	61.2	92.2	127.6	68.8
22	25.0	40.7	65.1	97.8	135.2	73.2
23	27.3	46.1	76.2	117.4	165.0	87.3
24	16.9	35.0	68.3	118.5	180.3	85.5
25	23.1	37.7	60.6	91.4	126.6	68.2
26	12.3	24.5	46.3	78.6	118.0	56.7
27	7.0	14.8	29.3	51.3	78.5	36.4
28	1.5	4.7	12.2	25.9	44.4	17.7
29	0.3	1.8	8.0	22.7	45.9	16.1
30	0.2	1.2	5.2	15.1	30.7	10.4
TOTAL	680.5	768.9	875.8	992.2	1105.4	885.3

Markoye

Decade	Probability levels (%) / Niveaux de probabilite (%)					Mean/ Moyenne (mm)
	90	75	50	25	10	
	--------Rainfall / Pluviometrie (mm)----------					
15	0.7	1.9	4.5	8.9	14.7	5.4
16	1.0	3.2	8.9	19.3	33.8	13.0
17	1.5	5.0	13.9	30.2	52.9	20.9
18	2.3	6.5	16.2	32.9	55.3	22.7
19	4.8	10.5	21.4	38.3	59.4	26.8
20	6.8	14.3	28.2	49.4	75.5	35.0
21	10.2	20.0	37.4	63.0	93.9	45.3
22	19.6	29.1	42.8	60.4	79.9	46.0
23	9.4	18.6	34.9	59.0	88.2	42.3
24	8.7	18.6	37.1	65.3	100.3	46.6
25	6.1	12.2	23.0	39.0	58.5	27.6
26	2.7	7.0	16.2	31.7	51.9	21.9
27	0.6	2.4	7.5	18.0	33.2	12.1
28	0.3	1.3	4.4	10.7	19.9	6.8
29	0.2	0.9	3.6	9.7	19.2	6.2
TOTAL	269.7	320.6	384.5	456.3	528.1	392.2

Decade	Probability levels (%) / Niveaux de probabilite (%)					Mean/ Moyenne (mm)
	90	75	50	25	10	
	----------Rainfall/Pluviometrie(mm)----------					
6	0.0	0.0	7.2	18.8	28.4	7.2
7	0.0	0.0	5.3	13.7	20.3	5.3
8	0.0	1.4	10.8	22.1	31.4	10.8
9	1.4	4.7	13.5	30.0	53.0	20.7
10	0.7	3.1	11.0	27.7	52.4	19.3
11	3.6	9.3	21.5	41.8	68.3	29.2
12	2.7	7.7	19.0	38.6	64.8	26.9
13	5.0	10.8	21.7	38.5	59.4	27.0
14	4.5	11.8	27.9	55.1	90.7	38.7
15	12.9	24.1	43.1	70.5	103.2	51.1
16	7.3	17.2	37.1	69.2	110.0	49.1
17	16.2	29.5	51.6	83.0	120.1	60.6
18	16.2	28.4	48.3	76.0	108.3	55.7
19	7.4	18.4	41.2	78.6	126.9	55.8
20	14.0	30.4	61.4	109.3	168.8	78.5
21	17.8	32.2	56.2	90.2	130.3	66.0
22	17.3	35.5	68.9	119.1	180.8	86.1
23	25.4	47.8	86.1	141.3	207.3	103.4
24	53.0	75.1	106.3	145.2	187.4	113.7
25	26.9	44.8	73.2	111.7	155.9	83.2
26	20.6	36.5	62.7	99.3	142.3	73.0
27	25.0	39.3	61.0	89.7	122.0	67.6
28	6.9	13.9	26.6	45.5	68.5	32.3
29	2.5	6.2	14.2	27.3	44.2	18.7
30	2.1	7.1	20.0	44.1	77.5	30.9
31	0.4	1.7	6.0	15.3	29.1	10.3
32	0.1	0.8	3.4	9.6	19.3	6.2
TOTAL	917.0	1056.3	1227.0	1415.3	1600.2	1245.2

Nouna

Decade	Probability levels (%) / Niveaux de probabilite (%)					Mean/ Moyenne (mm)
	90	75	50	25	10	
	---------Rainfall / Pluviometrie (mm)----------					
12	0.5	1.8	5.7	13.3	24.2	8.7
13	0.8	2.8	8.0	17.9	31.6	11.9
14	3.2	7.6	16.3	30.2	47.9	20.9
15	2.5	7.4	19.0	39.4	67.0	27.5
16	6.9	14.9	30.2	53.8	83.2	38.1
17	9.2	18.1	33.8	56.8	84.8	40.8
18	12.3	21.0	35.1	54.5	76.9	39.8
19	17.3	28.5	46.2	70.0	97.3	51.9
20	17.7	30.5	51.2	79.7	112.8	58.7
21	36.3	52.1	74.7	103.0	133.8	80.0
22	27.8	44.2	69.2	102.5	140.1	77.1
23	38.1	53.8	75.9	103.5	133.3	80.8
24	32.2	49.7	75.9	110.1	148.4	83.6
25	19.0	30.4	48.1	71.6	98.2	53.5
26	14.3	26.0	45.5	73.2	105.8	53.3
27	3.6	8.9	19.7	37.2	59.7	25.9
28	2.7	6.9	15.9	31.1	50.9	21.4
29	0.9	3.3	9.5	21.3	37.8	14.4
30	0.3	1.3	4.5	11.2	21.3	7.3
TOTAL	638.2	714.7	806.7	906.3	1002.6	814.1

Ouagadougou

Decade	Probability levels (%) / Niveaux de probabilite (%)					Mean/ Moyenne (mm)
	90	75	50	25	10	
	---------Rainfall/Pluviometrie(mm)---------					
11	0.3	1.3	4.5	11.2	21.3	7.2
12	0.8	2.8	8.2	18.7	33.4	12.6
13	2.1	5.6	13.2	26.2	43.2	17.9
14	3.0	7.2	15.9	29.8	47.7	20.6
15	6.9	16.3	35.2	65.4	103.9	46.4
16	10.5	18.0	30.2	46.9	66.4	34.2
17	9.3	17.9	33.1	55.2	81.8	39.6
18	17.0	26.1	39.5	57.1	76.6	42.9
19	17.9	27.6	42.2	61.1	82.3	46.0
20	22.2	34.6	53.3	77.9	105.5	58.7
21	34.6	48.9	69.1	94.3	121.5	73.6
22	27.1	39.9	58.4	82.0	107.9	62.9
23	22.0	40.4	71.5	115.8	168.3	84.8
24	39.4	56.6	81.2	112.2	145.9	87.1
25	29.1	41.4	58.9	80.8	104.5	62.7
26	9.3	20.1	40.5	71.8	110.7	51.3
27	9.4	16.4	27.9	43.8	62.5	31.8
28	2.7	6.1	12.8	23.4	36.8	16.0
29	0.5	2.1	6.6	15.8	29.1	10.6
30	0.3	1.2	4.1	10.1	19.0	6.4
TOTAL	621.1	709.5	817.2	935.4	1050.9	827.7

Ouahigouya

Decade	Probability levels (%) / Niveaux de probabilite (%)					Mean/ Moyenne (mm)
	90	75	50	25	10	
	------- Rainfall / Pluviometrie (mm) --------					
12	0.2	1.0	3.9	10.1	19.5	6.5
13	0.4	1.5	4.7	11.4	21.0	7.3
14	0.5	1.9	5.9	13.9	25.3	9.1
15	1.3	4.5	12.4	27.2	47.6	18.6
16	2.4	6.8	16.9	34.6	58.3	24.0
17	4.8	11.3	24.1	44.7	70.8	31.4
18	10.2	18.2	31.6	50.5	72.6	36.5
19	9.3	19.2	37.3	64.4	97.7	46.1
20	8.5	19.1	39.8	72.3	113.2	51.4
21	25.4	41.6	66.8	100.8	139.6	75.3
22	16.8	31.7	57.2	94.0	138.0	68.4
23	13.4	29.4	59.8	106.9	165.7	76.7
24	21.8	39.2	67.9	108.4	156.0	79.6
25	8.1	17.8	36.4	65.2	101.3	46.4
26	6.8	14.9	30.4	54.5	84.5	38.6
27	3.7	10.0	24.1	47.9	79.4	33.6
28	0.7	2.8	9.2	22.5	41.9	15.4
29	0.5	1.8	5.4	12.6	22.8	8.1
30	0.3	1.3	4.1	9.9	18.4	6.2
TOTAL	525.6	596.0	681.4	774.5	865.3	688.9

Pama

Decade	Probability levels (%) / Niveaux de probabilite (%)					Mean/ Moyenne (mm)
	90	75	50	25	10	
	---------- Rainfall/Pluviometrie (mm) ---------					
9	0.3	1.4	5.3	14.1	27.4	9.4
10	0.4	1.6	5.0	11.8	21.6	7.6
11	0.4	2.1	8.2	21.7	42.1	15.0
12	1.3	3.9	10.0	20.6	35.0	13.9
13	3.1	8.2	19.2	37.7	61.9	26.2
14	2.9	7.6	17.7	34.5	56.5	23.9
15	6.1	14.6	31.9	59.7	95.2	42.2
16	9.7	18.2	32.7	53.7	78.7	38.6
17	14.6	23.8	38.3	57.6	79.8	42.7
18	8.5	17.8	34.9	60.8	92.7	43.4
19	8.9	20.1	41.5	75.2	117.5	53.6
20	21.3	34.8	55.7	83.8	115.8	62.5
21	26.2	42.0	66.2	98.5	135.0	73.9
22	21.1	36.4	61.2	95.6	135.6	70.6
23	22.7	40.6	70.5	112.6	162.2	82.7
24	40.7	60.2	88.6	124.9	164.8	96.2
25	20.3	37.3	66.0	106.8	155.3	78.2
26	25.0	41.1	66.3	100.2	138.9	74.8
27	9.9	19.4	36.2	60.8	90.6	43.7
28	3.8	9.0	19.7	37.0	59.1	25.8
29	0.4	1.7	5.7	13.9	26.0	9.2
30	0.4	1.6	5.4	13.2	24.6	8.6
TOTAL	29.8	30.7	31.3	31.7	31.9	953.7

Decade	Probability levels (X)/ Niveaux de probabilite (X)					Mean/ Moyenne (mm)
	90	75	50	25	10	
	----------Rainfall/Pluviometrie(mm)---------					
9	0.4	1.4	4.7	11.3	20.9	7.3
10	0.3	1.4	4.8	11.9	22.4	7.7
11	0.6	2.6	8.9	22.2	42.0	15.3
12	1.6	4.8	12.7	27.0	46.5	18.5
13	3.2	8.2	18.6	35.9	58.3	24.9
14	3.8	9.1	20.2	38.2	61.2	26.6
15	6.4	14.7	31.1	57.0	89.9	40.4
16	7.9	16.7	32.8	57.4	87.7	40.9
17	9.0	18.2	34.6	59.0	88.7	42.2
18	7.3	16.1	33.0	59.2	92.1	42.0
19	10.7	20.3	37.0	61.2	90.1	44.1
20	13.1	25.9	48.5	81.7	122.0	59.0
21	12.4	26.3	52.3	92.0	141.2	66.1
22	21.3	38.9	68.5	110.7	160.7	81.1
23	26.0	44.1	73.0	112.5	158.3	83.6
24	20.9	40.3	74.3	123.8	183.5	90.1
25	22.3	38.2	63.6	98.6	139.2	73.0
26	20.5	33.7	54.3	82.2	114.0	61.2
27	10.3	19.7	35.8	59.1	87.0	42.6
28	1.7	5.3	14.2	30.4	52.4	20.9
29	0.5	2.2	7.3	18.0	33.7	12.2
30	0.4	2.1	7.8	20.2	38.9	13.9
TOTAL	580.5	719.7	899.4	1106.7	1318.3	928.8

Saria

Decade	Probability levels (%) / Niveaux de probabilite (%)					Mean/ Moyenne (mm)
	90	75	50	25	10	
	-------Rainfall / Pluviometrie (mm)---------					
11	0.5	1.8	5.2	11.7	20.8	7.4
12	0.8	3.0	9.4	22.0	40.2	15.0
13	1.4	4.4	11.7	24.7	42.3	16.8
14	3.1	7.4	16.2	30.4	48.6	21.0
15	4.1	10.5	23.8	45.8	74.4	32.1
16	7.8	15.2	28.2	47.3	70.3	33.7
17	10.4	18.3	31.2	49.3	70.4	35.8
18	13.4	22.8	37.8	58.5	82.4	42.9
19	14.4	24.5	40.7	63.0	88.9	46.3
20	25.8	38.3	56.5	79.7	105.3	61.0
21	29.7	44.7	66.8	95.2	126.8	72.7
22	32.0	46.5	67.4	93.7	122.6	72.4
23	25.7	41.3	65.4	97.6	134.1	73.2
24	46.9	63.3	85.7	112.8	141.6	89.9
25	25.1	38.6	58.9	85.3	114.8	64.6
26	16.6	29.4	50.5	80.0	114.6	58.6
27	8.0	14.6	25.8	41.6	60.5	29.9
28	1.3	4.3	12.2	27.1	47.7	18.6
29	0.9	2.9	7.8	16.9	29.3	11.2
30	0.3	1.2	4.0	9.5	17.6	6.0
TOTAL	0.0	0.0	0.0	0.0	0.0	819.6

Tenkodogo

Decade	Probability levels (%) / Niveaux de probabilite (%)					Mean/ Moyenne
	90	75	50	25	10	(mm)
	----------Rainfall / Pluviometrie (mm)--------					
9	0.3	1.1	3.7	9.0	16.8	5.6
10	0.2	1.0	4.0	11.3	22.7	7.5
11	0.4	1.6	5.2	12.5	23.2	8.1
12	0.7	2.8	9.4	23.2	43.2	15.9
13	1.3	5.1	15.9	37.1	67.5	26.0
14	2.1	6.7	17.8	38.1	65.9	26.5
15	7.4	15.9	32.0	56.6	87.2	40.2
16	3.2	9.1	22.3	45.0	75.4	31.5
17	6.5	13.9	28.1	49.8	76.8	35.2
18	10.4	21.2	40.7	70.1	106.0	50.2
19	5.0	13.3	31.4	62.0	102.3	43.8
20	7.4	18.0	39.7	75.1	120.5	53.3
21	18.7	35.1	63.0	103.3	151.3	75.3
22	15.3	32.3	64.0	112.4	172.2	80.9
23	13.0	30.4	65.3	121.0	191.9	86.6
24	34.2	55.8	89.5	134.7	186.4	101.1
25	19.5	36.0	63.9	103.7	151.1	75.8
26	11.2	23.2	45.4	79.1	120.5	56.7
27	6.0	15.3	34.8	67.2	109.1	47.5
28	1.0	3.6	10.8	24.8	44.6	17.0
29	0.4	1.6	5.5	13.6	25.4	8.9
30	0.3	1.7	6.4	17.0	33.2	11.6
TOTAL	627.8	747.0	896.4	1064.5	1232.5	915.9

Tougan

Decade	Probability levels (%) / NIveaux de probabilite (%)					Mean/ Moyenne (mm)
	90	75	50	25	10	
	------- Rainfall / Pluviometrie (mm) ---------					
12	0.3	1.5	5.3	13.4	25.6	8.9
13	0.3	1.5	5.1	12.9	24.3	8.4
14	0.6	2.1	6.2	14.3	25.7	9.3
15	2.2	6.8	18.4	39.3	68.0	27.4
16	1.4	5.0	14.6	33.0	58.8	22.9
17	1.6	5.5	15.8	35.5	63.0	24.7
18	10.5	21.1	40.1	68.4	102.9	49.1
19	2.7	8.7	24.0	52.1	90.9	36.6
20	3.1	10.2	27.7	60.0	104.4	42.3
21	28.9	48.5	79.6	121.9	170.7	90.8
22	4.1	13.5	37.3	81.7	142.9	58.0
23	4.3	15.2	44.5	100.6	179.4	71.9
24	28.2	50.1	86.3	137.1	196.7	101.1
25	3.8	11.7	31.1	66.3	114.2	46.9
26	2.1	7.7	22.9	52.3	94.0	37.0
27	3.9	11.8	30.5	63.8	108.8	45.0
28	0.8	3.0	8.9	20.0	35.8	13.5
29	0.4	1.8	5.8	14.2	26.4	9.4
30	0.3	1.8	7.4	20.3	40.3	14.2
TOTAL	529.5	615.1	720.6	837.5	952.9	732.1

Yako

Decade	Probability levels (%) / Niveaux de probabilite (%)					Mean/ Moyenne (mm)
	90	75	50	25	10	
	------- Rainfall / Pluviometrie (mm) --------					
11	0.2	0.9	3.1	8.1	15.7	5.0
12	0.2	1.2	4.9	13.8	27.6	9.3
13	0.9	2.8	7.6	16.4	28.4	10.8
14	0.8	2.9	8.5	18.9	33.5	12.7
15	2.1	6.4	16.7	35.2	60.1	24.4
16	5.3	11.0	21.4	37.2	56.6	26.2
17	3.7	9.4	21.5	41.4	67.1	28.9
18	11.4	20.4	35.1	55.8	80.1	40.5
19	16.4	26.6	42.4	63.5	87.5	47.2
20	16.2	28.5	48.8	77.0	110.1	56.5
21	30.1	46.9	72.3	105.6	142.9	79.9
22	16.8	31.4	56.4	92.2	134.9	67.1
23	23.5	40.8	68.8	107.7	152.9	79.6
24	30.7	47.8	73.8	107.9	146.2	81.7
25	14.5	27.0	48.3	78.8	115.2	57.3
26	13.8	24.7	42.9	68.5	98.6	49.9
27	4.0	10.0	22.6	43.2	69.9	30.2
28	1.0	3.3	9.0	19.7	34.4	13.2
29	0.5	1.8	5.5	12.8	23.4	8.3
30	0.4	1.4	4.5	10.7	19.5	6.8
TOTAL	576.5	649.5	737.6	833.3	926.2	745.0

APPENDIX VI - Analysis of Maximum Air Temperature

APPENDICE VI - Analyse de la temperature maximale de l'air

Key for Appendix VI/Cle pour Appendice VI

Month/Mois

1 = January / Janvier

2 = February / Fevrier

3 = March / Mars

4 = April / Avril

5 = May / Mai

6 = June / Juin

7 = July / Juillet

8 = August / Aout

9 = September / Septembre

10 = October / Octobre

11 = November / Novembre

12 = December / Decembre

Bobo-Dioulasso (53 years/ans)

Month/ Mo1s	Mean max. temp/ Temp. max. moy.°C	SD/ Ecart type	CV (%)	Probability (%) of max. temp/ Probabilite (%) de temp. max. >25°C	>30°C	>35°C	>40°C	>45°C
1	33.2	1.3	4	100	98	8	0	0
2	35.4	0.9	3	100	100	62	0	0
3	36.9	1.3	4	100	100	94	4	0
4	36.5	1.3	4	100	100	85	0	0
5	34.6	1.1	3	100	100	26	0	0
6	32.0	1.0	3	100	100	0	0	0
7	30.1	0.8	3	100	45	0	0	0
8	29.1	0.8	3	100	9	0	0	0
9	30.4	0.8	2	100	64	0	0	0
10	33.1	1.0	3	100	100	2	0	0
11	34.2	0.8	2	100	100	9	0	0
12	33.2	1.0	3	100	4	4	0	0
Total	33.2	0.6	2	-	-	-	-	-

Boromo (38 years/ans)

Month/ Mo1s	Mean max. temp/ Temp. max. moy.°C	SD/ Ecart type	CV	Probability (%) of max. temp/ Probabilite (%) de temp. max. >25°C	>30°C	>35°C	>40°C	>45°C
1	34.6	1.3	4	100	100	42	0	0
2	37.1	1.1	3	100	100	97	0	0
3	38.8	0.9	2	100	100	100	13	0
4	38.8	1.1	3	100	100	100	8	0
5	36.8	1.0	3	100	100	100	0	0
6	33.9	1.1	3	100	100	21	0	0
7	31.4	0.6	2	100	100	0	0	0
8	30.4	0.6	2	100	68	0	0	0
9	31.6	0.8	2	100	100	0	0	0
10	35.0	1.0	3	100	100	42	0	0
11	36.1	0.7	2	100	100	95	0	0
12	34.5	1.1	3	100	100	39	0	0
Total	34.9	0.5	1	-	-	-	-	-

Dori (48 years/ans)

Month/ Mo1s	Mean max. temp/ Temp. max. moy.°C	SD/ Ecart type	CV	Probability (%) of max. temp/ Probabilite (%) de temp. max. >25°C	>30°C	>35°C	>40°C	>45°C
1	33.0	1.6	5	100	96	13	0	0
2	36.0	1.5	4	100	100	73	2	0
3	39.3	1.4	3	100	100	100	25	0
4	41.5	1.0	3	100	100	100	90	0
5	41.0	1.1	3	100	100	100	83	0
6	38.4	1.3	3	100	100	98	8	0
7	34.5	1.2	4	100	100	38	0	0
8	32.9	1.6	5	100	98	10	0	0
9	34.6	1.7	5	100	100	38	0	0
10	38.4	1.2	3	100	100	100	4	0
11	37.1	1.1	3	100	100	96	0	0
12	34.0	1.3	4	100	100	25	0	0
Total	36.7	0.6	2	-	-	-	-	-

Fada N'Gourma (46 years/ans)

Month/ Mo1s	Mean max. temp/ Temp. max. moy.°C	SD/ Ecart type	CV	Probability (%) of max. temp/ Probabilite (%) de temp. max. >25°C	>30°C	>35°C	>40°C	>45°C
1	34.5	1.6	5	100	100	39	0	0
2	36.9	1.5	4	100	100	93	4	0
3	39.5	1.7	4	100	100	100	28	0
4	39.8	2.0	5	100	100	100	43	0
5	37.6	1.8	5	100	100	96	13	0
6	34.7	1.8	5	100	100	41	0	0
7	32.1	1.6	5	100	98	7	0	0
8	30.7	1.8	6	100	57	4	0	0
9	32.1	1.7	5	100	96	9	0	0
10	35.7	1.5	4	100	100	63	0	0
11	36.6	1.5	4	100	100	91	2	0
12	34.9	1.5	4	100	100	46	0	0
Total	35.4	1.2	3	-	-	-	-	-

Gaoua (49 years/ans)

Month/ Mo1s	Mean max. temp/ Temp. max. moy.°C	SD/ Ecart type	CV (%)	Probablllty (%) of max. temp/ Probabilite (%) de temp. max. >25°C	>30°C	>35° C	>40°C	>45°C
1	34.5	1.5	4	100	100	37	0	0
2	36.6	1.2	3	100	100	90	0	0
3	37.3	1.2	3	100	100	92	0	0
4	36.3	1.4	4	100	100	82	0	0
5	34.2	1.0	3	100	100	18	0	0
6	31.9	1.0	3	100	96	0	0	0
7	30.1	0.8	3	100	55	0	0	0
8	29.5	0.9	3	100	16	0	0	0
9	30.7	0.9	3	100	82	0	0	0
10	33.3	1.4	4	100	96	8	0	0
11	35.1	1.0	3	100	100	61	0	0
12	34.3	1.1	3	100	100	18	0	0
Total	33.6	1.1	3	100	100	18	0	0

Ouagadougou (31 years/ans)

Month/ Mois	Mean max. temp/ Temp. max. moy.°C	SD/ Ecart type	CV (%)	Probability (%) of max. temp/ Probabilite (%) de temp. max. >25°C	>30°C	>35° C	>40°C	>45°C
1	34.0	1.6	5	100	100	26	0	0
2	36.5	1.1	3	100	100	90	0	0
3	38.5	0.9	2	100	100	100	0	0
4	38.9	0.9	2	100	100	100	13	0
5	37.0	0.9	3	100	100	97	0	0
6	33.9	1.2	4	100	97	16	0	0
7	31.7	0.6	2	100	100	0	0	0
8	30.6	0.7	2	100	74	0	0	0
9	31.9	0.8	2	100	97	0	0	0
10	35.5	0.9	2	100	100	65	0	0
11	36.0	0.7	2	100	100	94	0	0
12	33.9	1.0	3	100	100	19	0	0
Total	34.9	0.4	1	-	-	-	-	-

Ouahigouya (32 years/ans)

Month/ Mois	Mean max. temp/ Temp. max. moy.°C	SD/ Ecart type	CV (%)	Probability (%) of max. temp/ Probabilite (%) de temp. max. >25°C	>30°C	>35°C	>40°C	>45°C
1	33.3	1.5	5	100	100	22	0	0
2	36.2	1.2	3	100	100	84	0	0
3	38.8	1.1	3	100	100	100	13	0
4	40.3	0.9	2	100	100	100	63	0
5	39.5	1.3	3	100	100	97	34	0
6	36.8	1.2	3	100	100	94	0	0
7	33.4	1.2	3	100	100	9	0	0
8	31.8	1.1	4	100	97	0	0	0
9	33.2	1.2	4	100	100	9	0	0
10	37.0	1.2	3	100	100	91	0	0
11	36.4	0.5	1	100	100	100	0	0
12	33.6	1.1	3	100	100	13	0	0
Total	35.6	0.5	1	-	-	-	-	-

APPENDIX VII - Analysis of Minimum Air Temperature

APPENDICE VII - Analyse de la temperature minimale de l'air

Key for Appendix VII/Cle pour Appendice VII

Month/Mois

1 = January / Janvier

2 = February / Fevrier

3 = March / Mars

4 = April / Avril

5 = May / Mai

6 = June / Juin

7 = July / Juillet

8 = August / Aout

9 = September / Septembre

10 = October / Octobre

11 = November / Novembre

12 = December / Decembre

Bobo-Dioulasso (53 years/ans)

Month/ Mois	Mean min. temp/ Temp. min. moy.°C	SD/ Ecart type	CV (%)	Probability (%) of min. temp/ Probabilite (%) de temp. min. >10°C	>15°C	>20°C	>25°C	>30°C
1	17.4	2.5	15	100	89	9	2	0
2	19.4	2.3	12	100	86	43	0	0
3	22.3	1.6	7	100	100	92	0	0
4	23.7	1.3	6	100	100	96	8	0
5	23.0	1.2	5	100	100	98	0	0
6	21.6	0.9	4	100	100	94	0	0
7	20.9	0.6	3	100	100	94	0	0
8	20.8	0.7	3	100	100	94	0	0
9	20.6	0.9	5	100	100	91	0	0
10	21.1	0.9	4	100	100	96	0	0
11	19.8	1.2	6	100	100	47	0	0
12	17.3	1.5	9	100	98	0	0	0
Total	20.7	0.9	4	-	-	-	-	-

Boromo (38 years/ans)

Month/ Mois	Mean min. temp/ Temp.min. moy.°C	SD/ Ecart type	CV (%)	Probability (%) of min. temp/ Probabilite (%) de ternp. min. >10°C	>150C	>20°C	>25°C	>30°C
1	16.3	1.0	6	100	87	0	0	0
2	19.1	1.2	6	100	100	24	0	0
3	22.7	1.1	5	100	100	100	0	0
4	25.2	0.8	3	100	100	100	55	0
5	24.8	0.7	3	100	100	100	29	0
6	23.0	0.7	3	100	100	100	0	0
7	22.0	0.4	2	100	100	100	0	0
8	21.7	0.3	2	100	100	100	0	0
9	21.5	0.5	2	100	100	100	0	0
10	21.6	0.5	2	100	100	97	0	0
11	18.5	1.3	7	100	100	18	0	0
12	16.5	1.1	6	100	92	0	0	0
Total	21.1	0.4	2	-	-	-	-	-

Dori (48 years/ans)

Month/ Mois	Mean min. temp/ Temp. min. moy.°C	SD/ Ecart type	CV	Probability (%) of min. temp/ Probabilite (%) de temp. min. >10°C	>15°C	>20°C	>25°C	>30°C
1	13.8	1.4	10	100	19	0	0	0
2	15.9	1.4	9	100	69	0	0	0
3	20.2	1.4	7	100	100	52	0	0
4	24.1	1.4	6	100	100	100	29	0
5	26.6	1.2	4	100	100	100	88	0
6	25.3	1.3	5	100	100	100	60	0
7	23.5	0.9	4	100	100	100	2	0
8	22.6	0.9	4	100	100	100	0	0
9	22.9	0.9	4	100	100	100	0	0
10	22.7	1.2	5	100	100	100	2	0
11	18.1	1.3	7	100	100	6	0	0
12	14.8	1.3	9	100	44	0	0	0
Total	20.9	0.7	3	-	-	-	-	-

Fada N'Gourma (29 years/ans)

Month/ Mois	Mean min. temp/ Temp.min. moy.°C	SD/ Ecart type	CV (%)	Probability (%) of min. temp/ Probabilite (%) de temp. min. >10°C	>15°C	>20°C	>25°C	>30°C
1	16.6	1.2	7	100	93	0	0	0
2	19.1	1.1	6	100	100	17	0	0
3	23.0	1.1	5	100	100	100	0	0
4	25.5	0.7	3	100	100	100	72	0
5	24.9	0.6	2	100	100	100	41	0
6	23.2	0.7	3	100	100	100	0	0
7	22.0	0.5	2	100	100	100	0	0
8	21.5	0.2	1	100	100	100	0	0
9	21.3	0.4	2	100	100	100	0	0
10	21.3	0.7	3	100	100	93	0	0
11	18.0	1.3	7	100	100	10	0	0
12	16.6	1.1	7	100	93	0	0	0
Total	21.1	0.4	2	-	-	-	-	-

Gaoua (28 years/ans)

Month/ Mo1s	Mean min. temp/ Temp.min. moy.°C	SD/ Ecart type	CV (%)	Probability (%) of m1n. temp/ Probabilite de temp. m1n. >10°C	>15°C	>2 0°C	>25°C	>30°C
1	18.7	1.0	5	100	100	14	0	0
2	21.4	1.1	5	100	100	82	0	0
3	23.8	0.7	3	100	100	100	0	0
4	24.2	0.7	3	100	100	100	14	0
5	23.3	0.5	2	100	100	100	0	0
6	22.0	0.5	2	100	100	100	0	0
7	21.4	0.3	2	100	100	100	0	0
8	21.2	0.3	1	100	100	100	0	0
9	21.0	0.3	2	100	100	100	0	0
10	21.5	0.4	2	100	100	100	0	0
11	20.4	0.8	4	100	100	61	0	0
12	18.7	0.9	5	100	100	4	0	0
Total	21.5	0.3	2	-	-	-	-	-

Ouagadougou (31 years/ans)

Month/ Mois	Mean min. temp/ Temp. min. moy.°C	SD/ Ecart type	CV (%)	Probability (%) of min. temp/ Probabilite de ternp. min. >10°C	>15°C	>20°C	>25°C	>30°C
1	16.4	1.1	7	100	87	0	0	0
2	19.1	1.2	6	100	100	19	0	0
3	23.3	1.5	6	100	100	100	3	0
4	25.8	0.8	3	100	100	100	84	0
5	25.3	0.6	2	100	100	100	68	0
6	23.5	0.7	3	100	100	100	0	0
7	*22.4*	0.5	2	100	100	100	0	0
8	21.8	0.3	2	100	100	100	0	0
9	21.8	0.5	2	100	100	100	0	0
10	22.5	0.6	3	100	100	100	0	0
11	19.5	1.3	6	100	100	23	0	0
12	16.9	1.1	6	100	100	0	0	0
Total	21.5	0.3	2	-	-	-	-	-

Ouahigouya (49 years/ans)

Month/ Mo1s	Mean min. temp/ Temp. min. moy.°C	SD/ Eca rt type	CV	Probability (%) of m1n. temp/ Probabilite (%) de temp. m1n.				
				>10°C	>15°C	>2 0°C	>25°C	>3 0°C
1	16.1	1.4	8	100	84	2	0	0
2	18.2	1.6	9	100	98	4	0	0
3	22.1	1.2	6	100	100	96	2	0
4	25.3	1.1	4	100	100	100	61	2
5	26.6	0.8	3	100	100	100	98	0
6	24.7	0.9	4	100	100	100	35	0
7	23.0	1.0	4	100	100	100	2	0
8	22.5	1.0	5	100	100	98	4	0
9	22.5	0.8	3	100	100	100	2	0
10	22.8	0.9	4	100	100	100	0	0
11	19.4	1.5	8	100	100	39	0	0
12	16.5	1.4	9	100	88	0	0	0
Total	21.7	0.7	3	-	-	-	-	-

APPENDIX VIII - Water Balance Analysis-Soil Water Estimation

APPENDICE VIII - Analyse du bilan hydrique—estimation de l'humidite du sol

Bobo-Dioulasso

Water-Holding Capacity/ Capaite de Retention en Eau . . . . : 100 mm

Decade	Rain/ Pluvio-metrie (mm)	AE/PE ETR/ETP	AE/ ETR (mm)	Deficit/ Deficit(mm)	Runoff/ Ruisselle-ment (mm)	SMOS/ SES (mm)
1	0.4	0.0	1.1	0.8	0.0	1.3
2	0.3	0.0	0.9	0.7	0.0	0.8
3	0.0	0.0	0.8	0.6	0.0	0.3
4	1.1	0.0	1.2	0.3	0.0	0.6
5	0.7	0.0	1.1	0.4	0.0	0.6
6	1.6	0.0	1.3	0.2	0.0	1.1
7	2.7	0.0	2.7	0.5	0.0	1.5
8	7.8	0.1	5.2	0.6	0.5	3.9
9	10.3	0.1	9.6	2.2	0.0	4.6
10	8.2	0.1	8.3	1.8	0.0	4.7
11	14.6	0.2	12.5	1.5	0.0	6.9
12	23.0	0.3	18.7	1.4	0.0	11.1
13	30.1	0.4	24.5	2.5	0.2	16.5
14	27.7	0.4	25.6	3.7	0.3	18.2
15	47.7	0.6	39.6	3.1	0.1	26.3
16	37.5	0.6	33.6	3.4	0.7	29.5
17	44.1	0.7	38.1	2.9	1.5	34.0
18	44.2	0.8	38.9	3.7	0.6	38.7
19	55.7	0.8	41.0	3.1	4.0	49.4
20	73.2	0.9	41.4	2.1	15.3	65.9
21	82.0	0.9	45.0	2.1	25.6	77.2
22	85.9	0.9	41.2	2.7	35.6	86.4
23	97.7	0.9	39.9	1.7	53.8	90.4
24	104.8	0.9	44.8	2.2	58.2	92.2
25	80.7	1.0	42.7	2.9	38.8	91.5
26	68.8	1.0	43.1	3.9	27.4	89.8
27	44.0	0.9	44.1	12.0	10.5	79.3
28	28.1	0.9	43.0	19.5	2.5	61.9
29	21.5	0.8	37.8	17.9	0.9	44.8
30	17.7	0.6	32.8	16.8	0.0	29.8
31	7.3	0.4	17.9	11.9	0.0	19.2
32	3.0	0.2	10.8	8.3	0.0	11.5
33	1.0	0.1	5.9	4.9	0.0	6.6
34	0.6	0.1	3.3	2.9	0.0	4.0
35	1.2	0.0	2.2	1.6	0.0	2.9
36	0.0	0.0	1.4	1.3	0.0	1.6

AE: Actual evapotranspiration — ETR: Evapotranspiration reelle
PE: Potential evapotranspiration — ETP: Evapotranspiration potentielle
SMOS: Soil-moisture storage — SES: Stock d'eau du sol

Bobo-Dioulasso

Water-Holding Capacity / Capacite de Retention en Eau . . . . . : 200 mm

Decade	Rain/ Pluvio-metrie(mm)	AE/PE ETR/ETP	AE/ ETR(mm)	Deficit/ Deficit (mm)	Runoff/ Ruisselle-ment (mm)	SMOS/ SES (mm)
1	0.4	0.1	6.1	5.8	0.0	18.9
2	0.3	0.1	4.8	4.6	0.0	14.5
3	0.0	0.1	4.1	4.1	0.0	10.4
4	1.1	0.1	3.1	2.6	0.0	8.4
5	0.7	0.0	2.5	2.0	0.0	6.7
6	1.6	0.0	1.8	1.2	0.0	6.4
7	2.7	0.0	2.6	1.2	0.0	6.6
8	7.8	0.1	4.3	1.1	0.0	10.1
9	10.3	0.1	7.3	2.2	0.0	13.1
10	8.2	0.1	6.7	2.2	0.0	14.6
11	14.6	0.1	9.8	2.1	0.0	19.5
12	23.0	0.2	14.8	1.5	0.0	27.6
13	30.1	0.3	20.8	2.0	0.0	37.0
14	27.7	0.3	21.1	2.4	0.0	43.6
15	47.7	0.5	34.4	2.3	0.0	56.9
16	37.5	0.5	30.1	2.8	0.0	64.3
17	44.1	0.7	35.0	2.2	1.0	72.4
18	44.2	0.7	36.1	2.4	0.0	80.6
19	55.7	0.8	38.1	1.8	1.1	96.9
20	73.2	0.9	40.2	1.7	7.7	122.2
21	82.0	0.9	44.1	1.6	15.7	144.4
22	85.0	0.9	40.5	2.1	25.2	164.6
23	97.7	0.9	39.8	1.7	43.7	178.8
24	104.8	0.9	44.8	2.2	53.4	185.5
25	80.7	1.0	42.7	1.9	37.7	185.8
26	68.8	1.0	43.4	4.2	26.5	184.8
27	44.0	1.0	44.6	12.5	10.2	174.1
28	28.1	0.9	44.4	21.0	2.5	155.3
29	21.5	0.8	42.2	22.2	0.9	133.7
30	17.7	0.7	41.1	25.1	0.0	110.3
31	7.6	0.6	29.0	22.8	0.0	88.7
32	3.0	0.5	22.5	19.8	0.0	69.2
33	1.0	0.3	16.9	15.8	0.0	53.3
34	0.6	0.3	12.7	12.1	0.0	41.3
35	1.2	0.2	9.8	9.0	0.0	32.7
36	0.0	0.2	8.5	8.5	0.0	24.2

AE: Actual evapotranspiration — ETR: Evapotranspiration reelle
PE: Potential evapotranspiration — ETP: Evapotranspiration potentielle
SM0S: Soil-moisture storage — SES: Stock d'eau du sol

Boromo

Water-Holding Capacity/Capaclte de Retention en Eau . . . . .: 100 mm

Decade	Rain/ Pluvio-metrie(mm)	AE/PE ETR/ETP	AE/ ETR (mm)	Deficit/ Deficit(mm)	Runoff/ Ruisselle-ment (mm)	SMOS/ SES (mm)
1	0.5	0.0	1.2	1.0	0.0	2.2
2	0.1	0.0	0.9	0.8	0.0	1.5
3	0.1	0.0	0.8	0.6	0.0	0.9
4	0.2	0.0	0.6	0.4	0.0	0.6
5	1.3	0.0	1.4	0.3	0.0	0.8
6	0.4	0.0	0.7	0.3	0.0	0.7
7	2.3	0.0	1.9	0.3	0.0	1.5
8	2.0	0.0	2.2	0.7	0.0	1.7
9	4.4	0.1	3.9	0.6	0.0	2.4
10	6.1	0.1	0.8	0.0	0.0	3.6
11	9.6	0.1	7.9	1.2	0.0	5.3
12	17.2	0.2	14.3	1.8	0.0	8.3
13	22.7	0.3	19.1	2.0	0.0	12.0
14	27.4	0.4	22.3	1.9	0.2	16.9
15	38.4	0.5	33.8	2.2	0.0	21.5
16	35.0	0.6	31.4	2.8	0.0	25.1
17	40.5	0.6	34.3	2.8	0.0	31.4
18	43.6	0.7	35.5	3.2	0.8	38.8
19	54.3	0.8	38.9	2.1	4.0	50.2
20	72.0	0.9	42.1	2.9	12.0	68.0
21	71.8	0.9	46.5	3.0	15.6	77.7
22	79.9	1.0	42.6	2.2	29.7	85.3
23	89.8	1.0	41.9	2.7	43.0	90.2
24	98.4	1.0	47.2	1.2	47.3	94.1
25	75.9	1.0	44.0	2.7	32.4	93.5
26	60.8	1.0	44.9	6.1	20.7	88.8
27	42.5	1.0	44.9	14.2	9.5	76.9
28	23.1	0.9	41.5	22.0	2.3	56.2
29	14.5	0.7	32.4	18.7	0.0	38.3
30	10.4	0.5	24.2	14.6	0.0	24.5
31	6.6	0.3	13.6	8.6	0.0	17.5
32	1.2	0.2	8.0	6.8	0.0	10.8
33	1.0	0.1	4.5	3.9	0.0	7.3
34	1.0	0.1	3.0	2.4	0.0	5.2
35	0.9	0.1	2.1	1.7	0.0	4.0
36	0.0	0.0	1.5	1.5	0.0	2.6

AE: Actual evapotranspiration — ETR: Evapotranspiration reelle
PE: Potential evapotranspiration — ETP: Evapotranspiration potentielle
SM0S: Soil-moisture storage — SES: Stock d'eau du sol

Boromo

Water-Holding Capacity/Capacite de Retention en Eau . . . . . : 200 mm

Decade	Rain/ Pluvio-metrie(mm)	AE/PE ETR/ETP	AE/ ETR (mm)	Deficit/ Deficit (mm)	Runoff/ Ruisselle-ment (mm)	SMOS/ SES (mm)
1	0.5	0.2	5.8	5.6	0.0	25.6
2	0.1	0.1	4.8	4.7	0.0	20.5
3	0.1	0.1	4.5	4.3	0.0	16.1
4	0.2	0.1	3.3	3.3	0.0	13.0
5	1.3	0.1	3.5	2.6	0.0	10.8
6	0.4	0.1	2.0	1.8	0.0	9.2
7	2.3	0.1	2.8	1.8	0.0	8.7
8	2.0	0.0	2.7	1.8	0.0	8.1
9	4.4	0.1	3.6	1.4	0.0	8.9
10	6.1	0.1	4.1	1.2	0.0	10.8
11	9.6	0.1	5.9	1.6	0.0	14.5
12	17.2	0.2	12.1	2.0	0.0	19.7
13	22.7	0.3	15.0	1.6	0.0	27.4
14	27.4	0.3	17.7	1.5	0.0	37.1
15	38.4	0.5	28.9	1.3	0.0	46.5
16	35.0	0.5	26.0	1.5	0.0	55.6
17	40.5	0.6	30.7	1.6	0.0	65.5
18	43.5	0.6	31.5	2.0	0.0	77.6
19	54.3	0.7	36.1	1.2	0.6	95.2
20	72.0	0.9	40.3	2.0	4.0	122.9
21	71.8	0.9	45.2	2.1	7.7	141.8
22	79.9	1.0	42.1	1.9	20.5	159.2
23	89.8	1.0	41.6	2.6	30.0	177.3
24	98.4	1.0	47.1	1.2	42.2	186.3
25	75.9	1.0	44.0	2.7	29.9	188.3
26	60.8	1.0	44.8	6.1	19.5	184.8
27	42.5	1.0	45.1	14.3	9.4	172.8
28	23.1	0.9	43.5	24.0	2.3	150.0
29	14.5	0.8	38.7	24.9	0.0	125.9
30	10.4	0.7	34.4	24.6	0.0	101.9
31	6.6	0.5	23.9	18.9	0.0	84.6
32	1.2	0.4	18.1	16.9	0.0	67.7
33	1.0	0.3	13.6	12.9	0.0	55.1
34	1.0	0.3	10.6	9.9	0.0	45.4
35	0.9	0.2	8.5	8.0	0.0	37.8
36	0.0	0.2	7.6	7.6	0.0	30.2

AE: Actual evapotranspiration ETR: Evapotranspiration reelle
PE: Potential evapotranspiration ETP: Evapotranspiration potentielle
SM0S: Soil-moisture storage SES: Stock d'eau du sol

Water-Holding Capacity/ Capacite de Retention en Eau.....: 100 mm

Decade	Rain/ Pluvio-metrie(mm)	AE/PE ETR/ETP	AE/ ETR (mm)	Deficit/ Deficit (mm	Runoff/ Ruisselle-ment (mm)	SMOS/ SES (mm)
1	0.7	0.0	0.8	0.5	0.0	1.1
2	0.1	0.0	0.7	0.5	0.0	0.7
3	0.1	0.0	0.6	0.3	0.0	0.4
4	0.4	0.0	0.7	0.2	0.0	0.5
5	0.0	0.0	0.6	0.2	0.0	0.3
6	0.1	0.0	0.4	0.1	0.0	0.2
7	0.3	0.0	0.7	0.1	0.0	0.3
8	0.3	0.0	0.7	0.2	0.0	0.3
9	0.6	0.0	1.0	0.2	0.0	0.4
10	0.3	0.0	0.8	0.2	0.0	0.3
11	0.7	0.0	0.9	0.1	0.0	0.4
12	3.9	0.0	3.0	0.1	0.0	1.7
13	3.4	0.1	3.4	0.8	0.0	1.9
14	8.5	0.1	6.9	0.5	0.0	3.7
15	12.3	0.2	11.5	1.2	0.0	4.6
16	14.8	0.2	12.9	1.0	0.0	6.6
17	18.5	0.2	16.4	1.2	0.0	8.7
18	29.1	0.4	22.8	1.2	0.0	15.0
19	35.5	0.5	30.9	2.2	0.0	19.6
20	39.8	0.6	34.3	2.2	0.0	25.1
21	56.6	0.7	43.8	2.7	3.3	34.6
22	51.7	0.8	40.4	4.7	1.8	44.1
23	60.1	0.8	43.9	2.1	2.3	58.0
24	63.7	0.9	53.2	8.1	7.3	61.2
25	33.8	0.8	42.7	14.0	1.5	50.8
26	31.4	0.7	38.0	13.1	2.0	42.2
27	21.6	0.6	31.9	13.8	0.1	31.8
28	7.0	0.4	19.9	13.1	0.0	19.0
29	5.4	0.2	12.6	8.0	0.0	11.8
30	4.8	0.2	8.6	4.5	0.0	8.0
31	0.6	0.1	3.6	3.1	0.0	5.0
32	0.0	0.0	2.6	1.9	0.0	3.1
33	0.3	0.0	1.2	1.1	0.0	2.2
34	0.0	0.0	0.7	0.7	0.0	1.5
35	0.2	0.0	0.6	0.5	0.0	1.2
36	0.0	0.0	0.5	0.5	0.0	0.7

AE: Actual evapotranspiration — ETR: Evapotranspiration reelle
PE: Potential evapotranspiration — ETP: Evapotranspiration potentielle
SMOS: Soil-moisture storage — SES: Stock d'eau du sol

Water-Holding Capacity/Capacite de Retention en Eau . . . . . : 200 mm

Decade	Rain/ Pluvio-metrie (mm)	AE/PE ETR/ETP	AE/ ETR (mm)	Deficit/ Deficit (mm)	Runoff / Ruisselle-ment (mm)	SMOS/ SES (mm)
1	0.7	0.1	2.6	2.3	0.0	12.3
2	0.1	0.1	2.2	2.1	0.0	9.9
3	0.1	0.0	2.0	2.0	0.0	8.0
4	0.4	0.0	1.6	1.5	0.0	6.8
5	0.0	0.0	1.3	1.3	0.0	5.5
6	0.1	0.0	0.9	0.9	0.0	4.6
7	0.3	0.0	1.1	0.9	0.0	3.9
8	0.3	0.0	0.9	0.8	0.0	3.3
9	0.6	0.0	1.0	0.7	0.0	2.9
10	0.3	0.0	0.9	0.7	0.0	2.4
11	0.7	0.0	0.9	0.6	0.0	0.0
12	3.9	0.0	1.9	0.4	0.0	4.3
13	3.4	0.0	2.4	1.0	0.0	5.3
14	8.5	0.1	4.5	0.6	0.0	9.4
15	12.3	0.1	7.7	1.3	0.0	14.1
16	14.8	0.1	9.9	1.1	0.0	19.0
17	18.5	0.2	13.0	1.3	0.0	24.5
18	29.1	0.3	17.8	1.1	0.0	35.8
19	35.5	0.4	24.8	1.6	0.0	46.4
20	39.8	0.5	29.2	1.6	0.0	57.1
21	56.6	0.6	38.6	1.3	0.0	75.0
22	51.7	0.7	38.2	4.2	0.5	88.1
23	60.1	0.8	41.2	1.0	1.5	105.4
24	63.7	0.8	48.9	4.6	2.1	118.1
25	33.8	0.7	39.4	11.6	0.0	112.5
26	31.4	0.7	37.3	13.2	0.5	106.0
27	21.6	0.6	34.0	16.0	0.0	93.7
28	7.0	0.5	26.1	19.3	0.0	74.6
29	5.4	0.4	20.7	15.9	0.0	59.4
30	4.8	0.3	16.8	12.6	0.0	47.3
31	0.6	0.2	10.5	10.0	0.0	37.4
32	0.0	0.2	7.7	7.6	0.0	29.8
33	0.3	0.1	5.9	5.7	0.0	24.3
34	0.0	0.1	4.5	4.4	0.0	19.8
35	0.2	0.1	3.5	3.4	0.0	16.5
36	0.0	0.1	3.2	3.2	0.0	13.3

AE: Actual evapotranspiration ETR: Evapotranspiration reelle
PE: Potential evapotranspiration ETP: Evapotranspiration potentielle
SMOS: Soil-moisture storage SES: Stock d'eau du sol

Fada N'Gourma

Water-Holding Capacity / Capacite de Retention en Eau . . . . . : 100 mm

Decade	Rain/ Pluvio-metrie (mm)	AE/PE ETR/ETP	AE/ ETR (mm)	Deficit/ Deficit(mm)	Runoff/ Ruisselle-ment(mm)	SM0S/ SES (mm)
1	0.0	0.0	0.7	0.7	0.0	0.8
2	0.1	0.0	0.6	0.5	0.0	0.4
3	0.0	0.0	0.6	0.3	0.0	0.2
4	0.4	0.0	0.7	0.1	0.0	0.3
5	0.0	0.0	0.6	0.2	0.0	0.2
6	0.8	0.0	1.2	0.1	0.0	0.1
7	1.1	0.0	1.2	0.1	0.0	0.5
8	1.2	0.0	1.4	0.3	0.0	0.7
9	5.8	0.1	4.6	0.2	0.0	2.1
10	5.6	0.1	5.1	0.8	0.0	2.7
11	6.1	0.1	5.7	1.1	0.0	3.2
12	13.3	0.2	11.1	0.9	0.0	5.4
13	19.4	0.2	16.2	1.3	0.0	8.6
14	25.3	0.3	21.7	2.2	0.0	12.2
15	34.6	0.5	31.6	3.0	0.0	15.2
16	36.6	0.5	31.8	2.1	0.0	20.0
17	44.8	0.6	37.6	2.1	0.0	27.2
18	41.5	0.7	37.1	3.2	0.0	31.7
19	46.2	0.7	38.2	3.5	1.4	38.4
20	61.9	0.9	43.5	3.6	2.5	54.3
21	71.8	0.9	48.4	4.2	10.2	67.5
22	82.6	1.0	44.9	3.8	21.3	83.8
23	94.0	1.0	45.5	1.7	40.9	91.4
24	77.7	1.0	49.5	3.1	27.4	92.2
25	73.7	1.0	46.0	4.3	28.6	91.2
26	55.0	1.0	45.9	9.0	16.3	83.9
27	33.4	0.9	45.1	17.6	3.5	68.4
28	13.3	0.8	38.6	25.5	0.0	43.4
29	8.0	0.5	25.7	18.1	0.0	25.7
30	7.7	0.3	17.5	10.8	0.0	15.9
31	1.8	0.2	8.3	6.8	0.0	9.4
32	0.5	0.1	4.4	4.1	0.0	5.5
33	0.0	0.0	2.3	2.3	0.0	3.2
34	0.4	0.0	1.4	1.2	0.0	2.2
35	0.0	0.0	0.8	0.8	0.0	1.5
36	0.2	0.0	0.7	0.6	0.0	1.0

AE: Actual evapotranspiration — ETR: Evapotranspiration reelle
PE: Potential evapotranspiration — ETP: Evapotranspiration potentielle
SMOS: Soil-moisture storage — SES: Stock d'eau du sol

Fada N'Gourma

Water-Holding Capacity/Capacite de Retention en Eau . . . . : 200 mm

Decade	Rain/ Pluvio-metrie (mm)	AE/PE ETR/ETP	AE/ ETR (mm)	Deficit/ Deficit (mm)	Runoff/ Ruisselle-ment (mm)	SMOS/ SES (mm)
1	0.0	0.1	4.1	4.1	0.0	15.2
2	0.1	0.1	3.3	3.3	0.0	11.9
3	0.0	0.1	3.0	3.0	0.0	9.0
4	0.4	0.0	2.2	2.0	0.0	7.1
5	0.0	0.0	1.7	1.7	0.0	5.5
6	0.8	0.0	1.8	1.0	0.0	4.5
7	1.1	0.0	1.3	0.9	0.0	4.3
8	1.2	0.0	1.4	0.9	0.0	4.1
9	5.8	0.0	3.2	0.5	0.0	6.7
10	5.6	0.1	4.3	1.2	0.0	7.9
11	6.1	0.1	4.4	1.3	0.0	9.7
12	13.3	0.1	8.5	1.1	0.0	14.4
13	19.4	0.2	11.3	1.2	0.0	22.5
14	25.3	0.3	18.0	2.1	0.0	29.8
15	34.6	0.4	24.8	1.8	0.0	39.7
16	36.6	0.4	26.8	1.2	0.0	49.5
17	44.8	0.5	31.7	1.2	0.0	62.6
18	41.5	0.6	33.3	2.3	0.0	70.8
19	46.2	0.7	35.1	2.0	0.0	82.0
20	61.9	0.8	41.1	2.3	1.6	101.2
21	71.8	0.9	45.8	2.3	1.9	125.2
22	82.6	0.9	43.8	9.4	9.4	154.6
23	94.0	1.0	45.3	1.6	26.0	177.2
24	77.7	1.0	49.1	2.7	22.1	183.7
25	73.7	1.0	46.0	4.2	26.6	184.8
26	55.0	1.0	46.3	9.4	14.8	178.8
27	33.4	0.9	45.6	8.2	3.5	163.0
28	13.3	0.9	42.7	9.6	0.0	133.7
29	8.0	0.7	35.6	8.1	0.0	106.0
30	7.7	0.6	30.7	3.9	0.0	83.0
31	1.8	0.4	20.2	18.5	0.0	64.6
32	0.5	0.3	15.0	14.5	0.0	50.1
33	0.0	0.2	11.2	11.2	0.0	38.9
34	0.4	0.2	8.5	8.3	0.0	30.8
35	0.0	0.1	6.5	6.4	0.0	24.3
36	0.2	0.1	5.7	5.6	0.0	18.8

AE: Actual evapotranspiration — ETR: Evapotranspiration reelle
PE: Potential evapotranspiration — ETP: Evapotranspiration potentielle
SMOS: Soil-moisture storage — SES: Stock d'eau du sol

Farako-Ba

Water-Holding Capadty/Capadte de Retention en Eau . . . . . : 100 mm

Decade	Rain/ Pluvio-metrie (mm)	AE/PE ETR/ETP	AE/ ETR (mm)	Deficit Def1c1t(mm)	Runoff/ Ruissel le-- ment (mm)	SMOS/ SES (mm)
1	0.8	0.0	1.8	1.2	0.0	2.7
2	0.1	0.0	1.1	1.0	0.0	1.6
3	0.0	0.0	0.8	0.8	0.0	0.9
4	0.4	0.0	0.8	0.5	0.0	0.7
5	1.0	0.0	1.0	0.4	0.0	0.8
6	1.0	0.0	0.9	0.3	0.0	1.1
7	2.3	0.0	2.0	0.5	0.0	1.6
8	4.5	0.1	3.4	0.4	0.0	2.8
9	18.3	0.2	14.7	0.7	0.0	6.5
10	10.0	0.2	9.5	1.7	0.0	7.1
11	14.1	0.2	12.4	2.1	0.0	8.8
12	18.2	0.3	15.7	1.7	0.0	11.3
13	32.4	0.4	23.0	1.4	0.0	20.7
14	24.5	0.5	24.7	3.9	0.0	20.5
15	50.0	0.6	37.5	1.7	2.0	31.1
16	35.7	0.6	32.8	4.8	0.0	34.0
17	56.5	0.9	43.7	2.4	0.3	46.5
18	44.1	0.8	39.9	3.2	0.0	50.7
19	53.4	0.9	43.7	3.6	1.7	58.7
20	65.7	0.9	40.8	3.7	11.9	71.7
21	80.2	1.0	45.4	1.4	23.3	83.1
22	94.0	1.0	40.9	0.8	41.5	94.8
23	88.5	1.0	40.9	2.2	46.2	96.2
24	105.9	1.0	45.9	3.1	60.2	96.0
25	83.3	1.0	42.9	1.5	38.0	98.4
26	74.1	1.0	43.9	2.7	31.9	96.7
27	45.9	1.0	44.5	9.5	10.2	87.9
28	29.5	1.0	43.2	20.6	4.8	69.4
29	15.5	0.8	35.9	21.8	0.2	48.8
30	18.4	0.6	30.3	14.1	0.2	36.7
31	5.2	0.4	17.6	12.5	0.0	24.3
32	4.5	0.3	12.0	8.5	0.0	16.8
33	1.7	0.2	7.5	6.5	0.0	11.0
34	0.2	0.1	4.4	4.3	0.0	6.8
35	1.0	0.1	3.0	2.3	0.0	4.8
36	0.1	0.0	2.1	2.0	0.0	2.8

AE: Actual evapotranspiration — ETR: Evapotranspiration reelle
PE: Potential evapotranspiration — ETP: Evapotranspiration potentielle
SMOS: Soil-moisture storage — SES: Stock d'eau du sol

Farako-Ba
Water-Holding Capacity/Capacite de Retention en Eau . . . . : 200 mm

Decade	Rain/ Pluvio-metrie (mm)	AE/PE ETR/ETP	AE/ ETR (mm)	Deficit/ Deficit (mm)	Runoff/ Ruisselle-ment(mm)	SMOS/ SES (mm)
1	0.8	0.2	7.5	6.8	0.0	27.8
2	0.1	0.1	6.0	6.0	0.0	21.8
3	0.0	0.1	5.4	5.4	0.0	16.4
4	0.4	0.1	3.9	3.6	0.0	12.9
5	1.0	0.1	3.3	2.8	0.0	10.5
6	1.0	0.1	2.3	1.8	0.0	9.2
7	2.3	0.1	2.9	1.9	0.0	8.6
8	4.5	0.1	3.4	1.1	0.0	9.7
9	18.3	0.2	11.5	1.0	0.0	16.5
10	10.0	0.1	7.5	1.7	0.0	19.1
11	14.1	0.2	10.5	2.3	0.0	22.7
12	18.2	0.2	12.6	1.6	0.0	28.3
13	32.4	0.3	18.6	1.7	0.0	42.1
14	24.5	0.4	20.3	1.8	0.0	46.3
15	50.0	0.6	33.1	1.5	0.0	63.3
16	35.7	0.6	28.6	3.7	0.0	70.4
17	56.5	0.8	39.6	1.0	0.0	87.3
18	44.1	0.7	35.5	1.1	0.0	95.9
19	53.4	0.9	40.2	1.1	0.0	109.2
20	65.7	0.9	38.2	2.0	4.6	132.1
21	80.2	0.9	44.3	0.7	15.0	153.0
22	94.0	1.0	40.2	0.5	23.6	183.1
23	88.5	1.0	40.9	2.2	39.4	191.3
24	105.9	1.0	45.9	3.1	56.4	194.9
25	83.3	1.0	42.9	1.5	36.9	198.4
26	74.1	1.0	43.9	2.7	31.9	196.7
27	45.9	1.0	44.5	9.6	10.2	187.9
28	29.5	1.0	44.2	21.5	4.8	168.4
29	15.5	0.9	40.4	26.4	0.2	143.3
30	18.4	0.8	38.3	22.0	0.2	123.1
31	5.2	0.6	27.5	22.4	0.0	100.7
32	4.5	0.5	22.2	18.2	0.0	83.1
33	1.7	0.4	17.5	16.4	0.0	67.3
34	0.2	0.3	13.7	13.5	0.0	53.8
35	1.0	0.3	11.0	10.2	0.0	43.8
36	0.1	0.2	9.9	9.9	0.0	33.9

AE: Actual evapotranspiration — ETR: Evapotranspiration reelle
PE: Potential evapotranspiration — ETP: Evapotranspiration potentielle
SM0S: Soil-moisture storage — SES: Stock d'eau du sol

Gaoua

Water-Holding Capacity/Capacite de Retention en Eau . . . . .: 100 mm

Decade	Rain/ Pluvio-metrie (mm)	AE/PE ETR/ETP	AE/ ETR (mm)	Deficit/ Deficit (mm)	Runoff/ Ruisselle-ment (mm)	SMOS/ SES (mm)
1	1.8	0.1	2.4	1.5	0.0	3.7
2	0.9	0.0	1.8	1.4	0.0	2.8
3	0.2	0.0	1.4	1.3	0.0	1.6
4	1.6	0.0	1.9	0.7	0.0	1.4
5	2.1	0.0	1.8	0.6	0.0	1.7
6	2.1	0.0	2.1	0.7	0.0	1.9
7	3.9	0.1	3.3	0.6	0.0	2.7
8	10.0	0.1	7.8	1.1	0.0	5.0
9	18.3	0.2	15.5	1.2	0.0	7.8
10	21.4	0.3	17.9	2.5	0.1	11.2
11	26.8	0.4	21.3	2.3	0.2	16.6
12	31.2	0.5	26.0	2.9	1.0	20.8
13	43.9	0.6	33.2	2.1	1.6	29.8
14	40.7	0.7	35.7	3.9	0.9	33.9
15	56.0	0.8	44.0	4.4	4.9	41.0
16	51.0	0.8	41.7	2.7	4.7	45.7
17	56.6	0.9	42.9	2.3	2.4	56.9
18	53.8	0.9	42.8	5.9	8.1	59.8
19	62.8	0.9	40.7	5.2	14.9	66.9
20	72.3	0.9	39.1	3.2	22.9	77.3
21	75.2	0.9	43.1	5.0	28.8	80.6
22	78.3	0.9	38.4	3.5	35.0	85.6
23	90.9	1.0	39.5	3.3	47.8	89.2
24	92.0	1.0	44.2	3.0	47.3	89.7
25	83.8	1.0	41.1	0.9	38.9	93.4
26	79.2	1.0	42.8	2.6	37.3	92.5
27	63.8	1.0	43.8	6.0	24.1	88.5
28	36.6	1.0	43.7	15.3	6.8	74.6
29	27.9	0.9	41.1	18.0	2.0	59.5
30	25.5	0.7	38.4	16.2	2.2	44.5
31	12.2	0.6	25.7	14.9	0.0	31.0
32	7.4	0.4	17.2	11.3	0.0	21.3
33	2.0	0.2	10.2	8.4	0.0	13.1
34	4.4	0.2	7.5	4.5	0.0	10.0
35	0.8	0.1	4.3	3.7	0.0	6.6
36	0.4	0.1	3.0	2.8	0.0	4.0

AE: Actual evapotranspiration — ETR: Evapotranspiration reelle
PE: Potential evapotranspiration — ETP: Evapotranspiration potentielle
SMOS: Soil-moisture storage — SES: Stock d'eau du sol

Gaoua

Water-Holding Capacity/ Capacite de Retention en Eau . . . . .: 200 mm

Decade	Rain/ Pluvio-metrie (mm)	AE/PE ETR/ETP	AE/ ETR(mm)	Deficit/ Deficit (mm)	Runoff/ Ruisselle-ment (mm)	SMOS/ SES (mm)
1	1.8	0.2	8.8 7.8	–	0.0	32.5
2	0.9	0.2	7.0	6.6	0.0	26.4
3	0.2	0.1	6.5	6.4	0.0	20.1
4	1.6	0.1	5.5	4.3	0.0	16.2
5	2.1	0.1	4.5	3.4	0.0	13.8
6	2.1	0.1	3.7	2.4	0.0	12.2
7	3.9	0.1	4.2	2.2	0.0	11.9
8	10.0	0.1	7.2	2.0	0.0	14.7
9	18.3	0.2	12.1	1.6	0.0	20.9
10	21.4	0.3	15.8	2.8	0.0	26.6
11	26.8	0.3	17.2	*2.2*	0.0	36.2
12	31.2	0.4	21.6	2.4	0.0	45.8
13	43.9	0.5	30.1	2.1	0.0	59.6
14	40.7	0.6	31.9	2.3	0.2	68.1
15	56.0	0.7	38.3	2.1	2.0	83.8
16	51.0	0.8	38.1	1.6	3.1	93.7
17	56.6	0.8	40.8	1.8	1.1	108.4
18	53.8	0.8	39.4	3.6	5.2	117.6
19	62.8	0.9	38.8	3.9	11.6	130.0
20	72.3	0.9	38.0	2.7	15.0	149.3
21	75.2	0.9	42.4	4.6	21.1	161.1
22	78.3	0.9	38.6	3.7	28.1	172.7
23	90.9	1.0	39.6	3.4	44.7	179.2
24	92.0	1.0	44.3	3.2	42.9	183.9
25	83.8	1.0	41.5	1.3	36.4	189.9
26	79.2	1.0	42.8	2.6	37.1	189.2
27	63.8	1.0	43.9	6.0	23.4	185.7
28	36.6	1.0	44.2	15.8	6.8	171.3
29	27.9	0.9	43.3	20.2	1.6	154.4
30	25.5	0.8	43.4	21.2	2.0	134.4
31	12.2	0.7	33.6	22.5	0.0	113.1
32	7.4	0.6	27.2	21.1	0.0	93.4
33	2.0	0.5	20.9	19.2	0.0	74.4
34	4.4	0.4	16.8	13.4	0.0	62.0
35	0.8	0.3	12.7	12.1	0.0	50.0
36	0.4	0.2	11.3	11.2	0.0	39.1

AE: Actual evapotranspiration — ETR: Evapotranspiration reelle
PE: Potential evapotranspiration — ETP: Evapotranspiration potentielle
SMOS: So1l-mo1sture storage — SES: Stock d'eau du sol

Ouagadougou

Water-Holding Capacity/Capacite de Retention en Eau . . . . . : 100 mm

Decade	Rain/ Pluvio-metrie (mm)	AE/PE ETR/ETP	AE/ ETR (mm)	Deficit/ Deficit (mm)	Runoff/ Ruisselle-ment (mm)	SMOS/ SES (mm)
1	0.1	0.0	1.0	0.9	0.0	1.0
2	0.0	0.0	0.7	0.6	0.0	0.5
3	0.0	0.0	0.6	0.3	0.0	0.3
4	0.2	0.0	0.6	0.2	0.0	0.3
5	1.5	0.0	1.3	0.1	0.0	0.8
6	0.2	0.0	0.7	0.4	0.0	0.6
7	1.3	0.0	1.4	0.3	0.0	0.8
8	1.3	0.0	1.6	0.4	0.0	0.9
9	3.6	0.0	3.3	0.3	0.0	1.5
10	3.9	0.1	3.6	0.6	0.0	2.0
11	6.1	0.1	5.9	1.0	0.0	2.4
12	13.5	0.2	10.9	0.8	0.0	5.0
13	18.7	0.2	15.6	1.1	0.0	8.1
14	20.7	0.3	19.0	1.7	0.0	9.9
15	48.3	0.5	37.9	2.2	1.0	19.3
16	35.5	0.5	32.2	3.7	0.0	22.5
17	40.9	0.6	37.4	4.6	0.1	25.9
18	45.6	0.7	40.3	3.6	0.0	31.2
19	48.5	0.8	43.5	2.7	0.7	35.5
20	59.8	0.9	45.1	1.2	0.3	50.0
21	73.3	0.9	51.0	1.9	6.8	65.5
22	64.7	1.0	47.3	5.2	9.2	73.7
23	88.4	1.0	45.2	4.1	35.3	81.7
24	92.1	1.0	52.6	3.3	29.4	91.8
25	64.2	1.0	48.4	5.4	17.7	90.0
26	57.9	1.0	49.0	10.3	16.9	82.0
27	33.3	0.9	48.0	19.5	3.7	63.6
28	17.0	0.8	40.7	23.8	0.0	39.9
29	10.9	0.5	26.3	16.6	0.0	24.5
30	6.9	0.3	16.9	11.4	0.0	14.4
31	2.2	0.2	8.1	6.1	0.0	8.6
32	0.1	0.1	4.0	3.9	0.0	4.7
33	0.0	0.0	2.0	2.0	0.0	2.8
34	0.0	0.0	1.0	1.0	0.0	1.8
35	0.9	0.0	1.0	0.6	0.0	1.7
36	0.0	0.0	0.8	0.8	0.0	0.9

AE: Actual evapotranspiration — ETR: Evapotranspiration reelle
PE: Potential evapotranspiration — ETP: Evapotranspiration potentielle
SMOS: Soil-moisture storage — SES: Stock d'eau du sol

Ouagadougou

Water-Holding Capacity/Capacite de Retention en Eau . . . . .: 200 mm

Decade	Rain/ Pluvio-metrie (mm)	AE/PE ETR/ETP	AE/ ETR (mm)	Deficit/ Deficit (mm)	Runoff/ Ruisselle-ment (mm)	SMOS/ SES (mm)
1	0.1	0.1	3.9	3.8	0.0	14.6
2	0.0	0.1	3.1	3.1	0.0	11.5
3	0.0	0.1	2.8	2.8	0.0	8.7
4	0.2	0.0	2.1	1.9	0.0	6.8
5	1.5	0.0	2.0	1.5	0.0	6.3
6	0.2	0.0	1.2	1.1	0.0	5.2
7	1.3	0.0	1.5	1.1	0.0	5.0
8	1.3	0.0	1.7	1.0	0.0	4.6
9	3.6	0.0	2.6	0.8	0.0	5.6
10	3.9	0.0	2.9	1.1	0.0	6.6
11	6.1	0.1	5.4	1.3	0.0	7.3
12	13.5	0.1	8.1	0.8	0.0	12.8
13	18.7	0.2	10.2	0.9	0.0	21.3
14	20.7	0.2	14.7	1.5	0.0	27.4
15	48.3	0.4	31.4	1.7	0.0	44.3
16	35.5	0.4	26.5	1.9	0.0	53.2
17	40.9	0.5	32.9	3.2	0.0	61.2
18	45.6	0.6	35.3	2.5	0.0	71.5
19	48.5	0.7	38.8	1.4	0.0	81.2
20	59.8	0.8	43.6	1.3	0.0	97.4
21	73.3	0.9	48.3	0.9	0.9	121.4
22	64.7	0.9	44.4	2.9	2.2	139.5
23	88.4	0.9	44.0	3.2	25.5	158.4
24	92.1	1.0	52.0	2.8	22.5	176.0
25	64.2	1.0	47.6	4.6	11.9	180.7
26	57.9	1.0	48.7	10.0	15.9	174.1
27	33.3	0.9	48.1	19.6	3.7	155.6
28	17.0	0.9	44.6	27.6	0.0	128.1
29	10.9	0.7	36.5	26.8	0.0	102.4
30	6.9	0.5	30.5	24.9	0.0	78.8
31	2.2	0.4	20.0	17.8	0.0	61.1
32	0.1	0.3	14.6	14.5	0.0	46.6
33	0.0	0.2	10.7	10.7	0.0	35.9
34	0.0	0.2	7.9	7.9	0.0	27.9
35	0.9	0.1	6.1	5.4	0.0	22.7
36	0.0	0.1	5.3	5.3	0.0	17.4

AE: Actual evapotranspiration — ETR: Evapotranspiration reelle
PE: Potential evapotranspiration — ETP: Evapotranspiration potentielle
SMOS: Soil-moisture storage — SES: Stock d'eau du sol

Ouahigouya

Water-Holding Capacity/Capacite de Retention en Eau . . . . . : 100 mm

Decade	Rain/ Pluvio-metrie (mm)	AE/PE ETR/ETP	AE/ ETR([mm)	Deficit/ Deficit (mm)	Runoff/ Ruisselle-ment (mm)	SMOS/ SES (mm)
1	0.1	0.0	0.6	0.4	0.0	0.5
2	0.0	0.0	0.5	0.3	0.0	0.3
3	0.1	0.0	0.5	0.1	0.0	0.2
4	0.1	0.0	0.5	0.1	0.0	0.2
5	0.0	0.0	0.5	0.0	0.0	0.1
6	0.0	0.0	0.4	0.1	0.0	0.1
7	0.1	0.0	0.5	0.1	0.0	0.1
8	1.0	0.0	1.0	0.0	0.0	0.5
9	1.2	0.0	1.5	0.3	0.0	0.7
10	1.0	0.0	1.3	0.4	0.0	0.8
11	4.5	0.1	4.0	0.3	0.0	1.6
12	6.5	0.1	5.2	0.6	0.0	3.1
13	7.3	0.1	6.4	1.4	0.0	4.1
14	9.1	0.1	8.2	1.4	0.0	5.1
15	18.6	0.2	16.1	1.4	0.0	7.6
16	24.0	0.3	19.7	1.1	0.0	11.9
17	31.4	0.4	26.3	1.3	0.0	16.9
18	36.5	0.6	32.4	2.1	0.0	21.0
19	46.1	0.7	35.9	1.2	0.0	31.2
20	51.4	0.7	38.6	3.4	0.6	43.4
21	75.3	0.9	50.4	4.4	10.0	58.3
22	68.4	0.9	46.8	4.3	10.5	69.3
23	76.7	0.9	45.4	5.0	23.5	77.2
24	79.6	1.0	53.5	6.9	23.0	80.4
25	46.4	0.9	47.6	12.8	8.2	71.0
26	38.6	0.9	45.5	14.3	2.9	61.2
27	33.6	0.8	42.8	17.4	3.3	48.8
28	15.4	0.6	30.4	17.4	0.4	33.4
29	8.1	0.4	21.1	13.4	0.0	20.5
30	6.2	0.3	15.8	9.9	0.0	11.0
31	0.8	0.1	6.5	5.8	0.0	5.2
32	0.2	0.0	3.0	2.8	0.0	2.4
33	0.1	0.0	1.2	1.0	0.0	1.4
34	0.2	0.0	0.7	0.6	0.0	0.9
35	0.2	0.0	0.5	0.4	0.0	0.7
36	0.0	0.0	0.5	0.4	0.0	0.4

AE: Actual evapotranspiration — ETR: Evapotranspiration reelle
PE: Potential evapotranspiration — ETP: Evapotranspiration potentielle
SM0S: Soil-moisture storage — SES: Stock d'eau du sol

Ouahigouya

Water-Holding Capacity/Capacite de Retention en Eau . . . . . : 200 mm

Decade	Rain/ Pluvio-metrie (mm)	AE/PE ETR/ETP	AE/ ETR (mm)	Deficit/ Deficit (mm)	Runoff/ Ruisselle-ment (mm)	SMOS/ SES (mm)
1	0.1	0.1	2.5	2.4	0.0	11.6
2	0.0	0.1	2.1	2.1	0.0	9.5
3	0.1	0.0	1.9	1.8	0.0	7.7
4	0.1	0.0	1.5	1.4	0.0	6.3
5	0.0	0.0	1.2	1.2	0.0	5.1
6	0.0	0.0	0.8	0.8	0.0	4.4
7	0.1	0.0	0.9	0.8	0.0	3.6
8	1.0	0.0	1.0	0.6	0.0	3.7
9	1.2	0.0	1.2	0.8	0.0	3.6
10	1.0	0.0	1.1	0.8	0.0	3.4
11	4.5	0.1	3.5	0.7	0.0	4.3
12	6.5	0.1	3.8	0.8	0.0	7.1
13	7.3	0.1	4.8	1.4	0.0	9.6
14	9.1	0.1	6.2	1.4	0.0	12.5
15	18.6	0.2	11.0	1.4	0.0	20.2
16	24.0	0.3	16.1	1.3	0.0	28.0
17	31.4	0.3	20.6	0.7	0.0	38.8
18	36.5	0.5	27.6	1.3	0.0	47.5
19	46.1	0.6	31.3	1.1	0.0	62.3
20	51.4	0.7	33.9	1.9	0.0	79.9
21	75.3	0.8	46.0	1.6	1.6	107.6
22	68.4	0.9	45.5	3.4	4.2	126.3
23	76.7	0.9	43.3	3.7	12.9	146.9
24	79.6	1.0	52.1	5.8	15.5	158.9
25	46.4	0.9	46.2	11.8	5.5	153.6
26	38.6	0.9	45.7	14.4	2.5	144.0
27	33.6	0.9	43.7	18.4	2.8	131.0
28	15.4	0.7	36.5	23.4	0.1	109.9
29	8.1	0.6	30.3	22.4	0.0	87.8
30	6.2	0.5	28.0	22.4	0.0	66.0
31	0.8	0.3	19.0	18.2	0.0	47.8
32	0.2	0.2	14.0	13.8	0.0	34.0
33	0.1	0.2	8.8	8.7	0.0	25.3
34	0.2	0.1	5.5	5.4	0.0	19.9
35	0.2	0.1	3.6	3.5	0.0	16.5
36	0.0	0.1	3.2	3.2	0.0	13.3

AE: Actual evapotranspiration — ETR: Evapotranspiration reelle
PE: Potential evapotranspiration — ETP: Evapotranspiration potentielle
SMOS; Soil-moisture storage — SES: Stock d'eau du sol

RA 00104

ICRISAT

International Crops Research Institute for the Semi-Arid Tropics
Patancheru, Andhra Pradesh 502 324, India

ISBN 92-9066-122-4 Printed at ICRISAT Center ICR 87-0008